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All India Food Processors' Association

VOL.55

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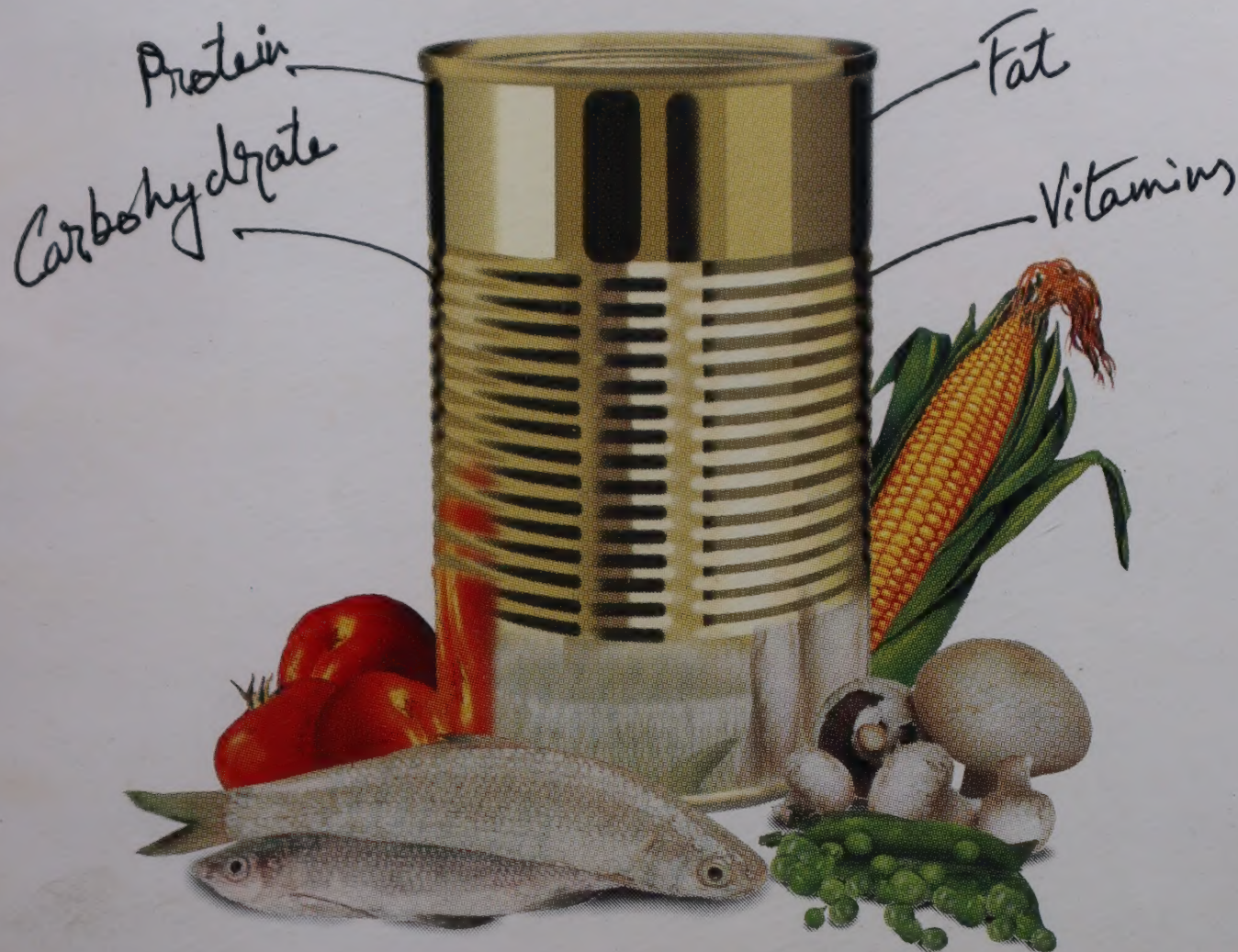
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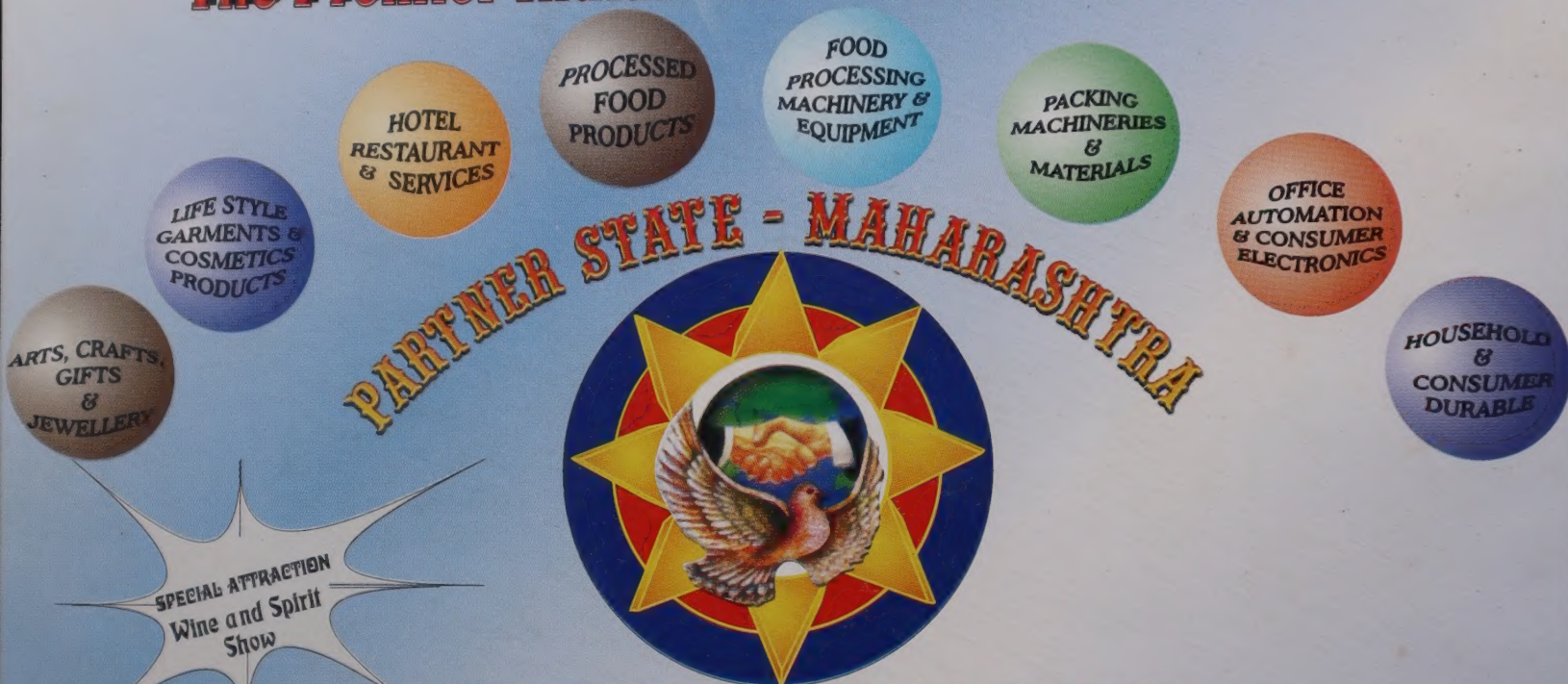
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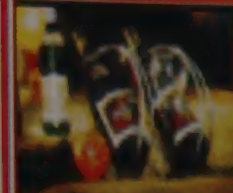
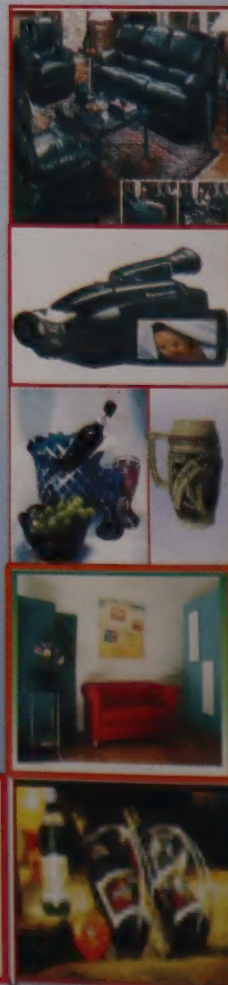
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ALL INDIA FOOD PROCESSORS' ASSOCIATION

Regd. Office: 206, Aurobindo Place, Hauz Khas, New Delhi - 110 016.

Ph : 6510860/6518848, Fax : 6510860

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Editorial

Excise off on processed Fruits & Vegetables

It is indeed heartening to note that in the Union Budget for 2001-2002, the Finance Minister has totally removed the Excise Duty which was being levied for the past few years on Fruit & Vegetables processed products. The persistent representations made by AIFPA in this regard have ultimately borne fruit. This would mean a great relief for the Fruit & Vegetable Processing Industry. It eliminates the need for maintaining all the records prescribed by the Excise Department, which was a difficult job to manage, particularly by the small scale units. This excise relief would not have been possible but for the active support given by the Union Department of Food Processing Industries, who have been advocating a Ten-Year tax holiday. The entire industry feels grateful to the Hon'ble Union Finance Minister for giving this exemption to the processed Fruit & Vegetable products.

The impact of the excise relief can be tremendous. It will give a fillip to the Industry to increase its production, as the products would become cheaper and the consumer demand would go up. The Industry can also attract Foreign Direct Investment once the hassles of taxation are removed. It would also lead to overall growth and development of the Fruit & Vegetable processing industry in the country.

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ASSOCIATION NEWS

Minutes of the Meeting of North Zone Committee held on 12.2.2001 in the Conference Room of Consultancy Development Centre, Lodhi Road, New Delhi

Shri Gokul Patnaik, President, presided over the meeting. The list of the members who attended is enclosed. (Leave of absence was granted to those who could not attend).

President welcomed the members and requested them to stand in silence for two minutes to pay tribute to the people who died in the Gujarat earth quake on 26.1.2001.

The purpose of this meeting mainly was to discuss about the Gujarat calamity and the remedial action which could be taken by members of the AIFPA. It was resolved that help will be extended by the Members of AIFPA through our Ahmedabad Chapter Chairman, Mr. Piruz Khambatta, who has already requested for food stuffs and donation to be sent to the address given below, which will be distributed under his supervision. "Vadilal Gota Godown, Denagar, Gota Village, Gandhinagar-Sarkihej Highway, Tal : Daskroi, Ahmedabad, Tel : 079-7471442."

It was decided that the Association should send Pickles to the community *langar* organised by the State Govt and Non Governmental Organisations (NGOs) for the affected people. The following members

announced their contributions to the Gujarat Relief Fund for this purpose:

| | Rs. |
|-------------------------------------|--------|
| 1. Shri Gokul Patnaik : | 5000/- |
| 2. Dr. A.G.Naik Kurade : | 1000/- |
| 3. Dr. S.Jindal / Mr. R Jindal : | 5000/- |
| 4. Mr. K.L.Radhakrishan : | 1000/- |
| 5. Mr. B.L.Kapoor : | 1000/- |
| 6. Mr. K.K.Malviya : | 1100/- |
| 7. Mr. R.L .Chopra : | 1000/- |

The Vice-President informed the members that a consignment of 100 cases of pickles & curried vegetables has already been sent to Mr. Piruz Khambatta by some of the member units in Delhi.

The opportunity of this meeting was also availed to discuss issues relating to Union Budget for 2001-2002 for which the Association has already sent their inputs. President briefed the members about the total concept of the work done. It was informed that the Department of Food Processing Industries and AIFPA are working on achieving zero Excise Duty and also reduction in Customs Duty on packaging materials used by the Food Processing Industry. The other issue which was taken up for discussion was on harmonization of standards

to be discussed in the coming Meeting of Central Fruit Products Advisory Committee (CFPAC) to be held on 20.2.2001 in the Department of Food Processing Industries.

In brief comments, President indentified that the role of FPO was developmental and that of PFA was to ensure that the food product is free from hazards to health. The BIS standards are supposed to be referral.

The members' opinion was that there is no need for all the three standards to adopt Codex. In fact, BIS should be the best place for the referral standards. It was decided that Shri P.P.S.Dhillon, Chairman of the Technical Advisory Committee will formalise views and discussions in the Food Advisory Committee.

It was proposed that all the associations concerned with food should take a uniform stand on Harmonization of Food Laws so that there should not be any contradiction in this respect.

The meeting ended with thanks to the Chair and members were requested to join for tea.

(K.P.Sarin)

Exccutive Secretary

Brief minutes of the Association chapter meeting held on 22nd Jan. 2001 at Vadodara

The first meeting of the new year 2001, of Association members was held on 22nd Jan. 2001 at Hotel Surya, Vadodara. This time, instead of inviting the Vadodara chapter members, we have invited Members from different chapters of West Zone, and announced the meeting as West Zone meeting. Mr. Amar Pandey of MAIDC graced the meeting as chief guest. We have around thirty members from different cities of Gujarat & Maharashtra.

We had kept a presentation on "Virtual Trade Fair by APEDA", but the same was cancelled at the last hour and have informed many members of this fact, and with this members were disappointed.

Mr. Vijay Shah in his welcome speech introduced the chief guest and other senior members of the Association and briefed the activity in the interest of the members. He gave a brief outline on his Delhi visit and present Govt. Assistance

scheme for the food processing industries. He also mentioned about the scheme prevailing in the Gujarat state and urged the members to avail the same in their own benefit. Mr. Shah also briefed the members about Barcode Scheme, and need of the same for future exports in relation to Public Notice issued by the Director General of Foreign Trade.

Mr. Pandey briefed members about the activities conducted by Association's Maharashtra chapters, and also informed about the Food Park which is to be set-up near Nagpur with the assistance of Ministry of Food Processing Industries, New Delhi. He also briefed the members about the various financial schemes available with MAIDC as a Nodal Agency of the Maharashtra Govt. He suggested that the members can do marketing in common brand name.

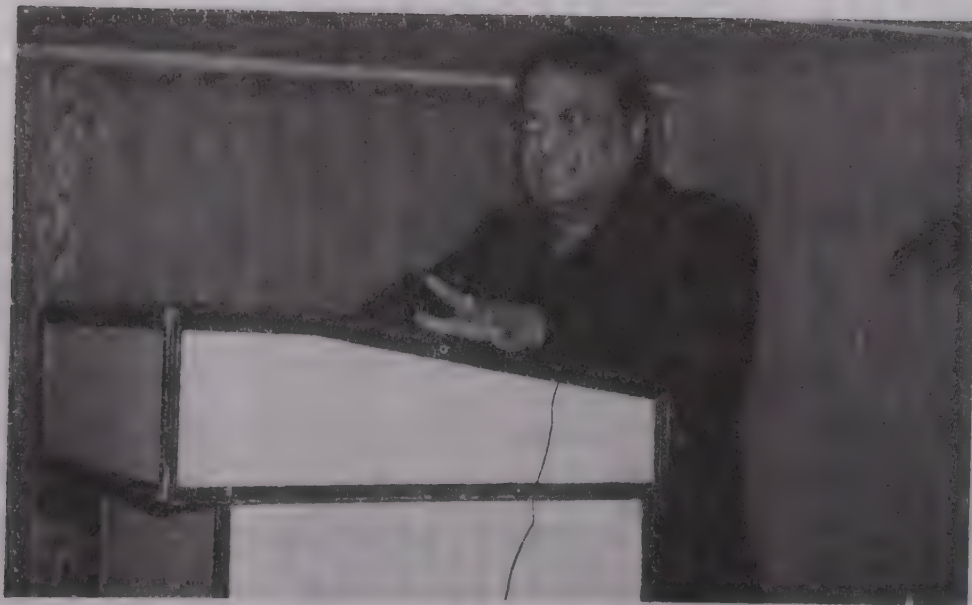
Mr. Desai, of Guj. Agro Industries Corpn, a Nodal Agency

of Gujarat state explained about the role of the nodal agency, and also informed & guided the members on market promotion. Mr. Vora, of LMP Agro, Vadodara, expressed his views on how to tackle the problems in mutual interest and procurement of Quality Raw material, for better finished goods at optimum level.

During the meeting it was decided to form a small committee to run the smooth working of the Chapter, and nominations have been invited from the members. Many members feel that Main Body should provide the financial support for arranging meetings and also authorized the Chapter to collect the fund for Technical Seminars and related activities.

The meeting was ended with vote of thanks.

Vijay Shah
Chapter Chairman



Mr. Amar Pandey addressing the gathering



A view of the gathering

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NEWS ROUND UP

Scientists urged to help increase Storage Life of Foods

The Union Minister of State for Food processing Industries, Mr. T. Choba Singh, has expressed unhappiness over the non-availability of quality raw material for the food processing sector.

Mr. Singh was delivering the inaugural address at the "Golden Jubilee Science and Industry Meet 2000" organised by the Central Food Technological Research Institute (CFTRI). The government agencies, research institutions and the industry should conduct research to help growers and producers of raw material to meet the standards of the food industry, he said.

Commending the CFTRI for its work in the food processing sector during the past 50 years, the minister urged the scientists to develop new varieties of crops to raise the yield and to increase the shelf life of food items. Regretting that the yield per acre in the country was among the lowest in the world, he said that several fruits and vegetables produced in the country were unsuitable for processing.

Mr. Singh said that little efforts were made to exploit the potential for the export of horticultural produces such as ginger, pineapple, citrus fruits and passion fruits. A food processing industry having "adequate backward linkages" for increasing the productivity, reducing the pre- and post-harvest wastage and generation of employment had to be developed.

These aspects had been given importance in the last decade and the perception of the potential of the sector had changed, he added.

Urging the scientists to utilise the opportunities provided by globalisation, the minister said that several new food processing technologies were being developed all over the world.

The CFTRI could adapt and modify them to suit Indian conditions. Though research in food processing was not confined to laboratories, the research institutions in the country had been hesitant to transfer technology to the industry.

He said the institutions such as CFTRI should disseminate information and knowledge to initiate public debates, which would influence policies. Considering the

importance of the field, the government had accorded priority to food processing and various policy initiatives had been taken.

These had resulted in investment approvals of over Rs. 70,000 crores since 1991 in the sector. The Government had been providing financial assistance for the development of infrastructure, human resource development and promotional activities,

Dr. V. Prakash, Director, CFTRI, said that the stipulation of the World Trade Organisation (WTO) and the need for export-oriented value-added products had made transfer of technology imperative. The institute would encourage local agricultural inputs through value addition for "induced" agriculture.

Dr. Prakash said that the institute was involved in research and development of indigenous technologies. A proactive policy was required to protect traditional technologies and practices keeping in mind the intellectual property rights.

The focus of the institute was to develop ecofriendly food engineering and manufacturing systems and understand the needs

of the people in rural areas.

A specific strategy was needed for food security, nutrition security and employment generation. The sustainability of the eco-system and the proper management of natural resources had to be considered.

Indian Food Industry Sep-Oct 2000



Food Parks to exploit International Food Processing Market

Floating of 'Food Parks' has been recommended by the Federation of Indian Chamber of Commerce and Industries (FICCI) food trade wing-Confederation of Indian Food Trade and Industry (CIFTI) in order to adequately exploit the 52,000 billion international market in the food processing sector.

"The food parks would serve as an incubator for start-up food companies and would offer small companies opportunities to grow without investing huge amounts of capital," said sources in CIFTI.

Subsidised financing from NABARD and the state financial institutions in such 'food parks' has also been proposed particularly for setting up the infrastructural facilities. A special provision in the fund that is being propped up by the department of food processing industries is also being looked into.

Suggesting this in a recently concluded study, the body has proposed that based on the price competitiveness the Indian food processing sector can emerge as a top leader if two factors like high cost due to inefficient and inappropriate infrastructure and low productivity are tackled.

According to the study, these parks would consist of various food processing facilities for the use of industry that would be availed of by the investors in the park. These facilities would also be rented out or sold to other food processing business owners.

The parks would also go a long way in reducing the costs and increasing efficiencies for business by stimulating entrepreneurial activity by the provision of a controlled and well managed environment with latest technology services as well as management and marketing techniques.

Indian Food Industry Sep-Oct 2000



Jackfruit processing fruitful SSI Venture

Food processing need not be only about multinationals and huge investments. While there are numerous problems associated with the industry, the Union Government is preparing to pass the Processed Foods Development Bill in Parliament. It has overlooked the

development of the industry at cottage industry level, according to industry sources.

The government is also conducting a roadshow to elicit suggestions and comments from industry members on the National Food Processing Policy.

Jackfruit is grown throughout Karnataka on the coffee and tea estates in six districts in the State including Mandya, Mysore and Bangalore. The fruit grows between March and August. In the first three months, it is traditionally converted to papad, which can be used any time of the year. When the fruit ripens, it is boiled, and jaggery is added to it and it is stored to make kheer.

The same storage skills and knowledge could be exploited to create a small-scale industry out of jackfruit.

This would greatly benefit the rural economy, which is now forced to become market-oriented. Farmers are no longer looking at simple self sufficiency but are geared towards growing enough to market commercially.

It could get the rural women (who generally do this work to process two to five kg of jackfruit each and make around 100-200 papads, which could be collected and marketed.

The simple scheme does not demand an additional investment,

power, or any other infrastructure. Besides, jackfruit grows almost wild, without any application of fertilisers and pesticides, making it a pure organic product.

Indian Food Industry Sep-Oct 2000



Vegetables fight Diseases

A "Super-Broccoli" that could help combat colon cancer and a tomato that may help to fight heart disease and other ailments have been developed by British scientists. The broccoli is the work of Dr. Richard Mithen at the John Innes Centre in Norwich, eastern England. The tomato, a product of genetic engineering that increases the beta-carotene contents of the fruit, is the work of an international team led by Dr. Peter Bramely of the University of London.

The broccoli looks and tastes like the ordinary variety but contains 100 times more of the chemical sulphoraphane that kills cancer-causing substances in food.

The chemical is also found in Brussels sprouts and cauliflower. Dr. Richard Mithen, a plant biologist crossed the English variety with a wild Sicilian species to create the new type of super broccoli that is expected to be in the shops by 2002.

Research showed that when sulphoraphane was released into

the gut, it stepped up production of powerful enzymes that destroyed cancer-causing food substances. During trials, volunteers were fed the super broccoli to assess its ability to produce cancer fighting enzymes. It is now generally acknowledged that a third of cancers are probably caused by bad diet. Increasing beta-carotene three-fold in tomatoes produces a compound that is thought to help the body fight heart disease, cancer and degenerative eye problems.

Commercially grown tomatoes carry only small amounts of beta-carotene but scientists now believe that a higher intake of the compound can boost the immune system. Using a gene from bacterium called *Erwinia uredovora*, Dr. Bramley and his colleagues have discovered a way of growing healthier tomato crops with increased amounts of the compound.

Because of the public's hostility to genetically modified (GM) foods, before proceeding further, researchers are awaiting the outcome of experiments on GM rice whose vitamin A content has been considerably increased in an attempt to combat blindness. Such rice would be of considerable benefit to the developing world where bilahariz is a major problem.

Indian Food Industry Sep-Oct 2000



Indian Meat Industry as compared to other Developing Countries

India possesses about 15% cattle (largest), 53.2 % buffaloes (largest), 19.7% goats, 5% poultry, 4.5% sheep and 1.2% pigs of the World's animal population, but India shares less than 1% of world's total meat production, which is 191.07 million tonnes per annum, along with, only 1.3 kg per capital availability of meat as compared to 32kg per annum for world's average consumption. Due to changing eating habits, economic conditions, urbanisation, industrialisation, consumers have also changed their meat consumption pattern. Beef and Carabeef (38.65%) were the largest contributors followed by pork (35.68%) in 1970 at a global level whereas by 1994 pork became largest contributor (27.59%) and chicken (25.35%) the second largest.

Meat Industry in India is based on nearly 192 million cattle, 78.92 million buffaloes, 44.81 million sheep, 118.35 million goats, 11.78 million pigs and 407 million poultry (FAO, 1994). According to official estimates, annual production of meat in India is about 1.3 million tonnes of which little over half is from sheep and goats, about one quarter from cattle and buffaloes and an equal amount from pigs and poultry.

Indian Packaged Water Market : A factsheet

| | |
|-----------------------------|----------------------|
| Volume: | 700 million litre |
| Organised sector: | 500 million litre |
| Value: | Rs. 500 crore |
| Market growth: | 30 percent per annum |
| Number of existing players: | approximately 100 |

Source : Business Standard

CIFTI update

Nov. 2000



WTO News-India for WTO Farm Tariff Review-phase-Out of subsidies doled out by Developed Nations sought

The Government has identified three major areas relating to market access in farm goods, on which it would negotiate a review of the WTO agreement on agriculture. The issues relate to reduction in agricultural tariff bindings, tariff rate quota and special safeguards. The government would also negotiate for phasing out of heavy subsidies to agriculture exports by developed countries. The agricultural ministry has said, "India is under no obligation to reduce domestic support currently extended to the agricultural sector. The minimum support price provided to commodities is less

than the fixed external reference price determined under the WTO Agreement on Agricultural. Even subsidies on agricultural inputs such as, power, irrigation, fertilisers, is well below the minimum permissible level of 10 per cent of the value of agricultural output. Export subsidies listed in the pact which attract reduction commitments are non-existent in India. Exemption of export profit provided in India from income tax is not part of the listed subsidies.

The background paper has noted that ministry has noted developing countries are free to provide certain subsidies, such as reduction of export marketing costs, internal and international transport and freight charges. Only APEDA is taking advantage of the latter facility in certain horticultural products.

But by manipulating their subsidy commitments, most developed countries have continued to provide substantial support to their agricultural sector. They have been shifting their subsidies from 'Amber Box' category which is prohibited under the agreement, to 'Blue Box and Green Box' categories which are permitted.

CIFTI update

Nov. 2000



Transgenic Tomatoes

Researchers with the

Agricultural Research Service and Purdue University have found a way to slow down tomato ripening and improve tomatoes' nutritional Quality. This is by a yeast gene that controls this function in the fruit.

Living cells, including those of plants, contain genes that control many functions. Some genes are "turned on" only at a certain development stage or in response to an environment cue. At other times, these genes are "turned off". Scientists can use genetic engineering technology to modify these genes to turn them on or off at any particular time.

The new transgenic tomatoes have a lycopene content 2.5 times higher than non-transgenic tomatoes. Lycopene is a carotenoid that may aid in preventing early blindness in children, preventing cancer and enhancing cardiovascular health.

Before the new tomato can be made available as a food, it will undergo years of rigorous testing for health and environmental safety.

CIFTI update

Nov. 2000



Indian gets Millennium World Food Prize

An Indian geneticist and a Mexican biochemist have been awarded the millennium world food

prize for their work on developing a protein-rich corn variety that can help prevent malnutrition among millions of poor people. The award to Ms Evangelina Villegas, a 75-years-old Mexican, and Ms Surinder Vasal, a 62-years old Indian plant genetist, carries a \$2,50,000 cash prize. Both scientists work at the International Maize and Wheat Improvement Centre in Mexico, a research facility sponsored by the Consultative Group on International Agricultural Research (CGIAR).

The new maize was developed during 35 years of research to introduce a gene that increases lysine and tryptophan, two amino acids essential for human nutrition, into commercially viable, quality corn. The enhanced corn, which is known as quality protein maize (QPM) underwent nearly two decades of field testing on 600 to 1,000 hybrid varieties a year before it became widely planted. Today QPM corn is being grown on one million hectares in 32 locations across Africa, Asia and Latin America. It provides a protein level equivalent to that found in skim milk.

CIFTI update

Nov. 2000



Oat Oil gives Bread a soft touch

Read the label on bread made in the United States and you'll

likely find vegetable shortening and other additives among the ingredients that increase loaf size, improve texture and lengthen shelf life. A smidgen of oat oil could do the same thing and may make bread more heart-healthy. Oat oil is rich in phospholipids and glycolipids, also called polar lipids. This type of oil combines with water to lubricate bread dough to help it rise evenly and bake into a loaf that is uniformly soft and springy, even after several days of storage.

For people who would rather avoid eating vegetable shortenings, which contain trans fatty acids that have been associated with heart disease, bread made with oat oil or its components could be an alternative dietary staple.

But the researchers also found they could achieve the same result by replacing the vegetable shortening with just 0.5 percent polar lipids taken from the oat oil. Polar lipids worked better in bread made from hard red winter wheat flour, the flour from which most bread is made, than in bread from more costly hard red spring wheat flour. Dough made from hard red winter wheat flour need less shortening to increase loaf volume, because of their high gluten content.

Presently, the most highly valued major component of oats is the bran. Oat oil comprises about 6 percent of most dehulled oats

but is now rarely sold as a commercial product. This research could potentially lead to a new market for oats.

CIFTI update

Nov. 2000



Technology to net food quality on-line

Scientists at Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO) are developing both electronic and chemical tools to warn consumers if food quality had been put to risk by high transit temperatures.

"New generation technology is helping to meet the challenge of delivering safe food bought over the internet," said Michael Rooney of Food Science Australia, a division of CSIRO. Rooney, a packaging materials specialist, said electronic chips would provide an audible warning while sensitive strips changed colour if perishable foods were exposed to excessive heat.

Speaking at a recent CSIRO food industry forum in Brisbane, Rooney said intelligent packaging that would alert consumers to food spoilage is a response to the e-commerce revolution. "Food ordered directly over the internet will move outside the established cold supply chain", he said. "Smart packaging has a role to play so consumers know their food is fresh.

It will give them confidence when they purchase on-line."

In addition, electronic packing technology could help food exporters ensure the integrity of their products for overseas customers. "it will be possible for manufacturers to monitor the temperature of produce on its way to overseas markets remotely via satellite," said Rooney.

In Australia, the typical internet shopper is a 30-year-old male, but women buying groceries are catching up, according to CSIRO. On-line grocery purchases are forecast to net US\$4.6 million in sales in the US by 2004. The main barriers to on-line shopping, however, are fear of credit card fraud and invasion of privacy.

Asia Pacific Food Industry Nov-Dec.. 2000



Next Exim policy to focus on value-added agricultural exports

The government is planning to have specific initiatives for value-added agricultural exports in the forthcoming Exim policy. The commodities singled out for attention include tea, basmati rice, sugar, fruits, vegetables, and fisheries.

Talking to ET on the sidelines of a national seminar on the export potential of potatoes, the Export Commissioner, Anil Swarup said

under the aegis of the new policy which would focus on general issues, the commerce ministry would like to address the specific problems being faced by these sectors and the incentives needed to promote exports.

"We are holding consultations with the trade bodies in these sectors, apart from APEDA and MPEDA, to finalise recommendations" he said.

Since the two biggest hurdles faced by exporters of processed food are shortage of power and costs of transportation, Mr Swarup said both these issues would be addressed in the new policy. "For the problem of power to run cold storage units, for instance, we would like to allow duty-free fuel for generator sets. This would facilitate fruit and vegetable processors and exporters", he pointed out.

The government is also exploring the option of giving market development assistance to certain designated bodies for promoting agro exports, since it is GATT legal.

According to Mr Swarup, there is tremendous scope for these commodities in the international market provided India can tailor its exports to specifics to each market.

We realise that at present India cannot participate in a major way in international markets because of the high domestic subsidy levels in markets like Europe and non tariff barriers such as sanitary and

phytosanitary restrictions in several other markets. But within five years, most of these problems would diminish considerably, for which we need to prepare now", he added.

Already, because of software, India is being perceived abroad as a supplier of good quality products and services. Piggybacking on that, we can extend this image to agro produce as well," Mr Swarup said.

According to the export commissioner, multinationals in the food processing industry have done very little to promote value-added exports from India despite the enormous incentives provided to them by the government. "We are quite disappointed by their performance," he added. Meanwhile, cold storage owners and vegetable exporters say simply improving technology and facilities is not enough. "India needs to promote its products as a 'Made in India' brand. Just as basmati and tea have been identified with India, the government needs to advertise so aggressively that foreign consumers immediately think of us first, especially in the products where we excel.

After all, USA has succeeded all over the world by talking of American french fries, American corn, and American soya. Without a similar effort, we'll continue to remain just one more supplier in the crowd for every commodity worldwide,' they pointed out.

Economic Times

18.12.2000



Seafood exports move up

The half-yearly export figures indicate a healthy growth in exports. Efforts to develop new markets and marketing tie-ups are essential.

The mood in the Indian seafood sector is upbeat with high unit value realisation providing a boost to exports. Half-yearly export figures show that exports have registered a healthy growth. With the industry implementing quality related changes the export efforts are likely to be better in the coming months.

Official sources pointed out that the efforts to develop new markets and new product groups are progressing well. Seafood exports from the country touched Rs. 3,004.78 crore in the first six months of the current year. Compared to this exports in the first six months of the previous year stood at Rs 2,270.57 crore. In percentage terms the increase is around 32.34 per cent. In quantity terms, exports stood at 1,40,491 tonnes as compared to 1,25,378 tonnes in the first half of the previous year registering an increase of 12 per cent. In dollar terms, exports registered a 26.9 percent increase in the first half of the year as it increased to US\$ 672.96 million from \$ 530.3 million.

The detailed analysis of the exports show that as a product group, shrimp constitutes 78.02 per cent of the total value of seafood exports. In quantity terms,

the share of this product group is 40 per cent. The export of shrimp increased by 35.66 per cent in rupee terms and 30.1 percent in dollar terms. However, in quantity terms the increase was only 11.17 per cent indicating a high unit value realisation for shrimp in the first half of the year.

Export of frozen fin fish increased by 24.11 per cent in quantity and by 30.64 percent in value. The highest increase in value terms was registered by the product group called chilled items. The product category registered a 89.13 per cent increase in value. However, the quantity of exports increased only by 16.8 per cent.

There was a 21.2 per cent increase in the export of the product category of live items. The quantity of exports increased by 19.47 percent. Export of frozen squid and dried items registered a negative growth in quantity.

However, there was an increase in the value of exports by 8.5 per cent and 65.66 per cent respectively. As far as markets are concerned Japan continued to dominate the imports with a share of 43.35 per cent in value and 22.92 percent in quantity. The US market accounted for 20.88 percent in value and 13.81 percent in quantity.

Sources at the Marine Products Export Development Authority pointed out that efforts to develop new markets are underway. Recent study on seafood market potential

in South Africa done by Tata Economic Consultancy Services points out that India should consider seafood sector as one of the thrust areas for expanding trade with South Africa. Similar studies are also being done for several new markets including Latin American countries. Officials pointed out that the international Seafood show to be held in Vishakhapatnam in February will be an attempt in developing new marketing tie ups. The show to be attended by fisheries industrialists, aquaculturists, exporters et al will showcase the products developed and the capabilities achieved by the Indian seafood sector. Exhibitors from India and abroad representing seafood, aquaculture and other areas of the fisheries sector are expected to participate in large numbers.

Official circles pointed out that this Seafood Show 2001 will provide a forum for both Indian and overseas business groups to come together and develop new business ties. For machinery manufacturers also it is expected to be a good form to display their products. Despite such efforts to increase the reach and spread of the Indian seafood sector, the dependency on a few markets is a reality that has to be accepted. Seafood export sector will hit an even higher growth trajectory when it acquires this broader base of exports.

Economic Times

25.12.2000



IIHR plan to raise yield of horticultural crops

The Indian Institute of Horticultural Research (IIHR), Bangalore, one of the largest of its kind in Asia, has formulated a mission-oriented perspective plan for the coming two decades. The plan aims at keeping constant the percentage of cultivated area under horticultural crops, which is about four per cent, and achieve a growth rate in productivity of around four per cent per year.

The plan has been conceived keeping in mind the needs of the growing population as well as to meet the demand from the international market, according to Mr. P. Parvatha Reddy, Director of IIHR.

He told a group of presspersons from here, who visited IIHR recently, that the institute would go in for a massive transfer of technology to the grassroots level so as to raise the productivity by 30-40 percent over the next seven years.

The investment in horticultural research had been very less until the Third five-year Plan. However, during the successive plans, the allocations had gone up and reached Rs 213 crore in the Ninth plan, representing nearly 10 per cent of the total outlay for agriculture.

According to the recommendatory dietary allowance (RDA) of the Indian Council for Medical Research (ICMR) the per capita consumption of fruits should be 120gm, which works out to about 42 million tonnes of actual production. Besides, the demand of the processing industry is about 8.5 m.t

According to a study, the total demand has been projected in the region of 68.5 m.t during 2000-2001 and at the current level of production of 46.97 m.t there is a huge gap to be bridged.

Dr. Reddy said the Institute had evolved maturity standards for a number of fruits. Methods for uniform ripening of fruits, their handling and storage, practice to extend shelf-life, preservation and packing had also been worked out for a variety of fruits and vegetables.

In the area of bio-technology, the institute had worked out protocols for micro-propagation and mass multiplication of horticultural crops such as genetic engineering, molecular diagnostics, bio fertilisers and bio-pesticides, he said.

The institute had so far released 26 improved varieties or hybrids in fruit crops such as mango, grapes, papaya, guava, litchi, acid lime, anona and pomegranate. In vegetables, 59 varieties / hybrids pertaining to 14 different crops had been released, of which 31

were at the national level and 28 at the State or institution levels.

These apart, 74 varieties/hybrids in ornamental crops and four varieties in medicinal crops had also been released by the institute. All the varieties had been bred for different biotic and abiotic stresses and exports, Dr Reddy said.

Economic Times

25.12.2000



ASSOCHAM moots cut in tax on processed foods

In view of the increasing challenges with the removal of quantitative restrictions (QRs), the Associated Chambers of Commerce and Industry (ASSOCHAM) has suggested reduction in excise and sales tax rates on processed foods to zero levels to give a fillip to the highly price elastic demand for branded products.

The chamber said the current levels of duties are pegged so high that in some states, this element alone pushes up prices by more than one third and in many cases by even half. Unless this is reversed, no amount of subsidies to promote the processed food sector will be of any avail.

An ASSOCHAM analysis shows that the overall market for value added foods would increase from \$21.4 billion in 1997 to \$62.5 billion by 2005. Majority of Indian

food manufacturers so far have targeted only elite consumers and focused on higher value added items like breakfast cereals, jams and sauces, whereas there is huge potential in mass-market products.

The opportunity to supply basic foods will be worth more than \$40 billion in this decade. Considering the cheap labour and surplus agricultural produce, India has potential to be dominant player in the international food market.

The industry, the chamber said, should minimise wastage at all stages in the food processing chain by development of infrastructures for storage, transportation and processing of agrofood produce; induction of modern technology into the food processing industries from both domestic and external sources; maximum utilisation of agricultural residues and by-products of the primary agricultural produce as also of the food industry; encouraging research and development in food processing for product and process development and improved packaging; ensuring timely and adequate finance.

It suggests creation of Indian brands and improving quality of processed food; facilitating backward and forward linkages between the agricultural producers and industry and encouraging captive farming.

Hindustan Times

26.12.2000



Thai instant food-maker to launch noodles brands

Sanwa Inter -Food Co Ltd. Thailand's leading makers of instant food, is eyeing the Indian noodles market and is drawing up plans for a joint venture to set up a manufacturing unit here.

It is going to hit the market with its two-minute instant noodles, and ready-to-eat cup format noodles within a few months. The company, which has an annual turnover of 10 million bahts and a daily production capacity of nearly 1,000,000 packs, plans to be in direct competition with Maggie Two -minute of Nestle and Top Ramen of Indo-Nissan Foods, which has dominated the business in India so far.

The export manager of Sanwa, Mr Sarawut Srimaneekulroj, said that the start-up cost for setting up such a unit would be Rs. 55 crore. The company has two brands Koka and Lorenzo. The Koka brand of soups and vermicelli is marketed in Thailand, Malaysia, Brunei, the Philippines and Japan and the instant noodles brand Lorenzo is exported to 18 countries in the west. The latter is available in all the leading supermarket chains in France, Norway, Sweden, the United Kingdom and US.

According to Mr Srimaneekulroj, the Sanwa's noodles will be available in various flavours such as vegetables, chicken curry and

shrimp. However, its beef brand will not be acceptable in India. According to the market research undertaken by the company, the beef flavour will be unacceptable in India. Sanwa will be concentrating mainly on marketing the vegetable and chicken flavours.

Mr. Srimaneekulroj plans to price its brands a jot lower than that of its competitors. The company is estimating an annual turnover of Rs 11 crore in India, 10 times that of their domestic turnover.

Once the products get a favourable response in India, the company will start marketing its Koka brand, mainly the flavoured soups and vermicelli.

Economic Times

26.12.2000



CII seeks removal of excise anomalies on food products

The Confederation of Indian Industry (CII) has called for checking the menace of spurious food products by removal of excise duty anomalies.

The apex industry association is also looking at reduction of special excise duty on aerated soft drinks and aerated water to 8 percent from the existing level of 24 percent in the forthcoming Budget.

CII, which is likely to submit its pre-Budget memorandum to the government soon, has asked for an

increase of abatement on maximum retail price (MRP) for the purpose of excise duty to 40 per cent for those products which attract an abatement of 35 per cent.

The branded and the unbranded food items, which command a different rate of excise duty, encourage sale of spurious products, CII has said. "Food items having abatement of 35 percent need to be increased to 40 per cent due to high post manufacturing expenses and other costs," a CII official told *The Financial Express*.

Items having abatement of 35 per cent include concentrated milk, cocoa powder, chocolate, malted food, noodles, instant coffee and branded and packed jams, jellies and fruit juices.

Stating that the existing abatement of 45 per cent for ice cream is inadequate to cover the post manufacturing expenses and refrigerated distribution cost, CII said abatement on ice cream should be increased to 50 per cent after verification of data on post manufacturing expenses and sales costs.

"Special excise duty on aerated soft drinks and aerated water should also be reduced from 24 per cent to 8 per cent in the coming Budget and be brought to the zero level in the subsequent Budget," the apex industry association said.

While aerated soft drinks and

aerated water have 16 percent excise duty in addition to 24 percent special excise duty, all other processed foods and beverages are free from special excise duty, he said, adding aerated soft drinks have been clubbed with pan masala and chewing tobacco, which is unfair, the official said.

Highlighting the coinage problem of sugar boiled confectionery, CII said excise duty up to a maximum retail price of Rs 2 should be reduced from 16 percent to 8 percent.

"Almost 95 percent of the sugar boiled confectionery is sold in retail market at prices ranging between 25 paise to Re 1 and cater to a large rural base and school children. There is a problem with respect to coinage.

Hence, the industry cannot position the product at prices other than 25 paise, 50 paise or Re.1. As a result, it has become difficult for the industry to pass on the hike in excise duty to the consumers," the CII said.

Excise duty on the sugar-boiled confectionery was increased from 8 percent to 16 percent in the Budget 2000-01.

Besides rationalisation of various duty structure, CII has demanded special focus on the food processing sector, as it is employment elastic and has tremendous potential for exports.

Financial Express

28.12.2000



India, US lead milk production to 575mt

Global milk output is expected to rise by two percent in the current calendar year due to an increase in production by India and the US, though limited export supplies would mean that prices remain high, a Food and Agriculture Organisation (FAO) study shows.

"Global milk output is expected to rise from 565 million tonne in 1999 to 575 mt in 2000 primarily due to an increase in production in India and the US," the study said adding "limited export supplies coupled with a sustained import demand were expected to lead to continued high prices for most dairy products".

It said India's milk production could rise to an estimated 79 mt. This growth was attributed to improved yields per animal rather than rise in animal numbers.

The production could be even higher because only 10 per cent of the output passed through the formal milk processing sector, making an exact assessment difficult, the study said.

In the US, favourable feed and weather conditions, increased yields per cow and herd expansion would help production rise to 75 mt from 73 mt in 1999 while the milk production in the US has risen as much in 1999 and 2000 combined, as it did in the previous seven years. The study predicted further expansion

in 2001 due to a favourable feed-milk price ratio.

In New Zealand, output had been affected by cold and wet weather in the peak production period of September-October. Consequently, production was expected to remain unchanged at 13mt. In Australia it was projected at 11.3 mt. - China, which had also focused on improved yields rather than the expansion of the dairy herd, would also register a moderate growth in output, the study said. However, due to dry conditions production was expected to be lower in most countries in Eastern Europe.

Additionally, in countries like Poland and Slovakia, stringent milk quality standards had resulted in reduced deliveries of milk to dairies. In Latin America, the fortune of the milk producers was increasingly linked to the international market as the domestic market was not growing sufficiently.

In this scenario, international prices for milk powder, butter and cheese which have already risen sharply could remain at the same levels or rise even further. Earlier, high domestic support prices in the developed nations and limitation of the use of export subsidies under the WTO also prevented substantial volumes being exported.

Economic Times

30.12.2000



All imported items placed under Packaged Commodities Rules

The government has extended the provisions of the Standard Weights and Measures (Packaged Commodities) Rules, 1997 to all imported goods, thus going beyond the list of 131 such products already notified.

In this regard, the director-general of foreign trade (DGFT) has issued a clarification.

The clarification follows doubts whether the above rules will apply to all pre-packaged imported goods or would be confined to those goods notified by the DGFT on November 23 last.

In a circular, DGFT explains that the compliance with the Indian quality standards is an independent provision and it will apply to all imports of pre-packaged products as applicable to similar domestic manufactured products. The move is aimed at giving the domestic industry a level playing field vis-a-vis foreign companies in the wake of removal of quantitative restrictions on the remaining 715 tariff lines by March 31, 2001. It is also the intention to prevent under-invoicing and other such malpractices.

DGFT has also stated that the provisions of Packaged Commodities Rules will not apply to those imports for which an irrevocable letter of

credit (LC) had been established prior to November 23 and imports had been made within the original validity of such L.C. Further, these rules will not apply where shipments had been made prior to this date, the circular said.

The twin measure to protect the domestic industry follows decisions taken by the Strategic Management Group (SMG) functioning in the Prime Minister's office. The group headed by Mr Brijesh Mishra, includes the cabinet secretary, and secretaries in the finance ministry, revenue department, commerce and industry ministry.

The SMG has been set up to take concrete measures on economic and inter-ministerial issues, including power and irrigation projects.

The government, it is stated, has other weapons in its armoury to prevent abnormal situations like a surge in import after the removal of QRs. It will raise tariffs even beyond the bound rates or customs duties, a safeguard measure ordained by the WTO. The bound rates are fixed at a certain level beyond which the customs duties cannot be raised under WTO rules.

As regards protection to the agricultural sector, the basic customs duty or import tariff has already been raised from April 5, 2000. The products include rice in husk (paddy or rough) from zero to 80 per cent, semi-milled or wholly milled rice,

whether or not polished or glazed, from zero to 70 per cent, broken rice from zero to 80 per cent and maize (corn) seed from zero to 50 per cent.

Financial Express

5.1.2001



India wastes food materials worth Rs 70,000 cr annually

The food wastage in the country amounts to Rs.70,000 crore, said Central Food Technological Research Institute (CFTRI), Mysore, director, V Prakash.

He laid stress on adoption of proper technologies for increasing the shelf life of fruits and vegetables by development of cold-chains, value additions and cleaner technologies for processing.

Similarly, Dr Gurdev S Kush of the Manila based International Rice Research Institute and winner of the World Food Prize cautioned that with the likely increase in the world population to 8 billion by 2005 there will be a need for increasing food production. Per capita food intake will rise due to improved living standards. India will have to produce 50 per cent more food by '25, he said, adding, therefore, a two-pronged strategy should be adopted like development of higher yielding crop varieties and closing the yield gap between potential yields and the actual yields obtained by farmers.

Dr Kush said the genetic yield potential of rice is about 10 tonne per hectare in the tropics, but the farmers obtain only about 5 tonne per hectare on the average. This yield gap is due to the losses caused by diseases and pests, biotic stresses and the use of sub-optimum management practices.

Financial Express

5.1.2001



M.P. to set up food processing park

Madhya Pradesh's first food processing park will be set up in Jaggakhedi industrial area of Mandsaur district at an estimated cost of Rs 8.15 crore, according to the State Industry, Commerce and Information Technology Minister, Mr Narendra Nahata.

Mr Nahata, in a release here, said the Union Government had sanctioned Rs 4 crore for the park while the remaining amount would be given by the State Government, according to an official release here.

With the Central assistance, cold storage, warehousing, godown, testing laboratory and treatment plant among others would be built, while from the State fund basic infrastructure facilities such as roads, street lights, drainage and water supply would be provided, the release said.

In the proposed park, fruits,

vegetables and other food-based industry would be set up, he said adding the project would be implemented by Madhya Pradesh Audyogik Kendra Vikas Nigam (Indore)Ltd.

Business Line

5.1.2001



Centre denies allegations of cheap milk product imports

The Union agriculture ministry has clarified that negligible quantity of milk and cream is being imported in the country. There is no truth in the reported cases of large-scale cheap imports, of the products as being alleged.

The quantum of import of milk and cream during April-September, 2000 was only 762 tonne which is negligible as compared to the estimated production of 78 million tonne of milk in 1999-2000 in the country.

The enquiry conducted by the agriculture ministry revealed that few shops, especially in the posh areas of Khan Market and Jorbagh are selling imported tetra pack doubled toned milk containing 1.5 per cent fat at a price ranging between Rs 44 to Rs 65 per litre, which is by any stretch of imagination beyond the reach of the ordinary consumer.

A section of the press had stated that imported milk is being sold in

Delhi, Haryana and Chandigarh at Rs 7 per kg. It further stated that imported liquid milk containing 1.5 percent fat is being sold at Rs.7 per litre and imported liquid milk containing 3.5 percent fat is being sold at Rs 10 per litre.

The agriculture ministry stated that it is gathered that the imported milk and cream is being sold to a select group of clientele, mostly foreigners, who by virtue of belonging to developed countries have developed a taste for such type of milk.

The ministry further clarified that similar mis-reporting in few sections of the press had earlier been noticed, especially from Punjab and Haryana wherein it was reported that butter-oil and skimmed milk powder (SMP) were being imported in the country in a large-scale.

However, the facts were on the contrary. The international prices of SMP and butter-oil are much higher than the domestic prices and imports during 1999-2000 of these products were in fact less than that in the previous year.

The Centre has already taken adequate steps to discourage import of milk and milk products, by raising tariff duty on these items. The tariff duty on import of milk powder has been raised to 60 percent and on butteroil, milk and cream to 44.04 per cent,

The agriculture ministry has stated that there is no case of mad cow disease in the country. Admidst reports that in the Kozikhode district of Kerala, some were affected by 'made cow disease', medical experts have already clarified that it was not the same dreaded disease which had made its appearance in Britain in the 80s. It is the sporadic form of Creutzfeldt Jacob disease (CJI) and not the one that is transmitted to humans from cattle and that there is no need for panic.

Financial Express 11.1.2001



'Evolve suitable food processing tech'

The Tamil Nadu Agriculture Minister, Mr Veerapandi S. Arumugam, has exhorted agricultural scientists to evolve suitable food processing technologies to help farmers raise their income.

Speaking after releasing 14 new crop varieties, on the occasion of farmer's day at TNAU here, Mr Arumugam said with the right kind of food processing technology, farmers could market their processed food products both in the domestic and export markets to sustain their income.

A suitable method to transfer this food processing technology to farmers should also be found, he

said.

Considering the price fluctuation, the farmers should also utilise these technologies by converting their produces into value-added products such as jams, jellies, pulps and also in dry and powder form.

Business Line

11.1.2001



NDDDB to set up veg market in Bangalore

The National Dairy Development Board (NDDDB), in association with the Karnataka state government, is all set to establish the country's first vegetables and fruits terminal market at Kannamangala near Bangalore. The projec, costing Rs.150 crore, in the first phase is expected to herald a radical change in horticulture marketing in the country by eliminating middlemen and establishing a state-of -the-art supply chain net work.

Detailed engineering for the terminal complex is under way and foundation stone. for the project is expected to be laid at the end of this month or early next month. Karnataka horticulture secretary, Upendra Tripathi told The Financial Express.

The project would comprise central auctioning and storage facilities. controlled temperature for receipt and desptach of produce, 10 whole sale shops, crate stores,

amenities like banks & post office, farmers training centre, cash and carry shops,

NDDDB was asked to set up such a facility by the Union Agriculture Ministry as part of its strategy to improve horticulture products marketing in four metropolises of the country. The Ministry had also asked NDDDB to undertake a study and formulate an implementable project for developing such facilities. The state government has already allotted 60 acres of land and the foundation stone, for the project would be laid very soon. The project is expected to be commissioned within two years from the date of commencement of work.

The terminal market is being designed to handle 30 percent of the Bangalore market with a provision for 100 per cent expansion in the future. The processing plant would handle 50,000 mt fruits and vegetables per year.

The NDDDB study found major drawbacks in the existing system which included inability of farmers to effectively bargain in terminal markets or 'mandis', lack of transparency, long chain of intermediaries, multiple handling, inadequate and improper logistics and a slew of other bottlenecks.

The study found that the consumer is paying much higher for the products due to such primitive practices.

The system is also not helping the farmers in getting a decent price as the existing structure has produced a vested interest in perpetuating the present system. The present system cannot be easily transformed; therefore the only way to modernise horticulture marketing is an after native marketing set-up that operates parallel and in addition to, the present *mandis*.

The study also found that the "agricultural produce marketing committees and the board members who manage markets in all states are nominated and therefore lack accountability to the users of the market, a problem accentuated by the monopoly role of regulated markets.

The backward linkages proposed in the Bangalore venture would comprise 42 collection centres to be set up in cultivation areas and forward linkages through 8 to 10 cash & carry stores to be set up in strategic locations in the city.

In addition to these, the project envisages cold storage facilities for bulk produce like potatoes in the future and a processing unit for fruits and vegetables.

Financial Express

12.1.2001



J-K fruit trade may get industry status

As part of its effort to provide a

boost to the fruit trade which fetches over Rs.1,000 crore for the state annually, Jammu and Kashmir government is planning to accord it industrial status.

Official sources said here that this year's fruit production in the state registered a record 11 lakh tonne. Of this, four lakh tonne have been exported so far.

The state government earned Rs 32 crore annually as toll from the trade, which provided employment to nearly 50 lakh people, sources said.

In order to boost marketing facilities 15 satellite markets were being set up in Kashmir Valley, besides fruit *mandis* in various parts of the state, they said.

According to sources, the government is giving Rs 40 crore as subsidy to the farmers and fruit growers on pesticides, insecticides and fertilizers.

The government proposed to pass a legislation against the sale of spurious pesticides, those who involved in such malpractices would be slapped with a fine of Rs 75,000 and three years imprisonment.

Sources said the government has earmarked an amount of Rs 6 crore for providing pumps on subsidy to the farmers in the state.

Business Standard

15.1.2001



High demand for organic food : Study

The study conducted jointly by the UN cooperation for trade and development (UNCTAD), and the Canada based International Development Research Centre (IDRC) stated that there are export opportunities for several environmentally preferable organic foods.

Niche markets for organic agricultural products hold promise for producers in developing countries like India, where traditional system of agriculture is still in vogue in many places and use of chemical fertilisers and pesticides are at a low key. The worldwide heightened consumer concerns in the area of food safety and quality, has generated renewed demand for organic food. A review by the International Trade Centre (ITC), Geneva has also indicated that while the market share of organic food on an average is no more than two per cent in most developed countries, in several of these markets the rate of growth is 25 to 30 percent per year.

The UNCTAD-IDRC study has identified different constraints in maintaining consistent production and exports of organic foods and have suggested solutions to the problems. It has called for involvement of large retailers and supply chain management of large companies, in marketing and exports of organic foods. There is a need to collect infor-

mation on the potential supply of organic food products and to identify the supply constraints.

The NGOs can effectively promote this trade by establishing direct links between producers and buyers, producers and exporters in developing countries and between importers and consumer organisations in develop countries.

The study suggested use of organic food labels for product certification and differentiation. It stated that in mainstream markets, self certification under particular corporate brands has increasingly influenced green consumerism. The best example is the marketing of organic Darjeeling tea by Starbucks in the US. To make certification more affordable for small producers, the study suggested mechanism of 'umbrella certification' for specific products and common brand names for products grown, in specific geo-climatic regions. Brand names are necessary for moving organic products out of commodities markets and auctions and to ensure premiums. Also electronic commerce can be a useful tool, to reduce the transaction costs of niche marketing.

Regarding quality certification, the study stated that there are a number of standards formulated all over the globe. However, standards formulated by two important fora, namely Codex Alimentarius Commission and the International Federation of Organic Agriculture

Movements (IFOAM) are important. The IFOAM members in India have already constituted a national standards committee in January 1996, which has submitted the basic national standards to the Centre, universities and other organisations for review.

Financial Express

12.1.2001



Efforts on to boost Bihar's litchi sales

With efforts on to put in place cold storage facilities and precooling plants in Muzaffarpur, Bihar hopes to significantly boost its sale of litchis in the next season to other parts of the country and export overseas.

Muzaffarpur, 100 km from Patna, is renowned for its luscious *Shahi* litchi. With the move to build cold storage facilities, precooling plants and atmospheric control containers at a cost of Rs 5 million, export is expected to go up to 200 tonnes in the next season. R K Kedia and KP Thakur, local entrepreneurs engaged in the litchi business, have started construction of the storage facilities. Half the expense would be borne by the Agricultural and Processed Foods Export Development Authority (APEDA) of the Union government.

Sources said pre-cooling plants protect litchis by storing them at a temperature of between 2 and 4 degrees celsius while cold storage

facilities keep the fruit at between 6 and 9 degrees celsius.

The atmospheric control container protects litchis during long transit. Muzaffarpur litchis reached London, via Mumbai, last year in 45 days in such containers.

Economic Times

15.1.2001



Karnataka to set up 5 food parks

Bangalore-based Karnataka State Agricultural Produce Processing & Export Corporation (Kappec) is contemplating tieups with the private sector for promoting food processing units in the state.

Besides promoting food processing facilities in the state, the new unit is also expected to serve as a unit servicing corporation's own requirements.

The state, which has planned to set up five food-parks, has approached the Centre for financial assistance in this regard. Of the five, the Centre has already approved two parks, Malur and Bagalkot. Incidentally, the Centre is providing assistance to the tune of Rs 5 crore per park. Tenders are expected to be issued soon, seeking private sector participation. The corporation, has gone ahead and prepared a blue print for a pilot project at a cost of Rs 19.6 crore.

The new unit would be used to process a wide variety of fruits and

vegetables including potatoes, onions and mangoes.

Kappec, which is an exporter of rose onions, has sold around 17,000 tonnes mainly to countries in Southeast Asian countries like Singapore and Malaysia.

Besides exporting to these countries, the corporation has also exported to Sri Lanka and Bangladesh. Rose onions, which are slightly blackishpink in colour are more pungent than regular onions and are used mainly as 'pickled onions'. The company is also engaged in export of niger seeds and has exported around 4,000 tonnes to the US and Europe.

The company also made an entry into the domestic market by supplying to RPG group company, Food -World last summer.

During the financial year '99-00, the company had revenues of Rs 41 crore, which is expected to rise to Rs 60 crore during the current financial year. The Karnataka State Agricultural Produce Processing Export Corporation claims that company's 75 per cent revenues are coming from exports.

It is estimated that close to 30 percent of India's horticulture produce is wasted for want of adequate processing facilities.

Economic Times

17.1.2001



R &D Grid mooted for food-processing industry

The Associated Chambers of Commerce and Industry (Assocham) has mooted proposal for setting up a National Research and Information Grid for Horticulture Trade (NRIGHT) jointly by industry and the government.

In a note to the food processing industry, Assocham has stated that the need for the proposed body has been necessitated for a continuous assessment in the size of the market, commodity composition, geographical distribution and changing consumer preferences.

The Chamber has stated that trade opportunities in fruits, vegetables and flowers are expanding nationally and internationally. Because of rising incomes and population, the demand for fruits and vegetables will grow in our country, and also the demand internationally will grow because of an increasing emphasis on "health foods", in which fruits and vegetables find a pride of place.

All these objectives can be attained by setting up a National Research and Information Grid for Horticultural Trade feels the Chamber.

Assocham has further stated that, the National Horticulture Development Board unfortunately has not developed along the lines the committee had envisaged. It was hoped that the Board will be like the

National Dairy Development Board, a friend, philosopher and guide to the numerous small-scale growers of fruits, vegetables and flowers in our country.

These growers generally get less than 20 percent of the price paid by the end consumer, unlike in milk, where the producer gets nearly 70 per cent of the end price. There are also violent fluctuations in prices, such as those we often witness in onion, potato and tomato.

The establishment of an effective storage, processing, packaging, transportation and distribution system is vital for sustaining a dynamic and producer-oriented horticulture industry, sanitary and phytosanitary standards and regulations will have to be developed and popularised. Cold storages and refrigerated vans are needed in large numbers, the Assocham note says.

The promotion of the horticultural seed villages in very block in the country will multiply and distribute pure seeds of both self-pollinated and hybrid strains, superior planting materials through a combination of tissue culture and mist propagation, undertake micropropagation of improved varieties and distribute planting material derived from tissue culture in polyethylene bags and encourage grafting and other methods of propagation in villages.

Tribune

15.1.2001



Govt likely to remove FDI irritants in proposed Food Processing Act

To Attract more foreign investment in the Indian food processing sector, the Union government is planning to overhaul the existing Act governing processed food industries and come out with a fresh one—the Processed Food Development Act.

According to sources, the new bill is targeted at removing impediments in the foreign direct investment as well as domestic investment from the private sector and introduction of new technologies in the sector. It also seeks to introduce a single-window system through the constitution of the Processed Foods Authority of India to improve investment climate in the sector.

It would also address several concerns of the industry relating to the manufacturing and processing of processed foods for the domestic and export markets and harmonising existing laws relating to the sector, which adversely affect the growth of the sector, sources told ET.

It would also seek to introduce good manufacturing practices and development of the processed food industry and trade on scientific lines to make the domestic industry compete in the new era of globalisation and take advantages from it, sources added.

A section of the industry that ET spoke to welcomed the move and said that besides the others, harmonisation of laws was very important since the food processing industry is governed by three laws from three different ministries - the food processing, health and civil supplies. Often, these ministries do not discuss issues and therefore, on the same issue, companies may have to deal with all three of them separately.

As per the proposed Act, the government may specify lower rates of customs and excise duties for merit goods with regard to the value addition in the manufacturing process and for products manufactured in backward, hilly and desert areas. Some sort of a transport subsidy is also being considered for products in these backward areas.

As far as the Processed Foods Authority of India is concerned, it would set up standards for manufacturing and processing of any article of processed food for domestic and export markets, for promoting good manufacturing practices, trade on scientific lines and development of the processed foods industry in general.

Besides specifying procedure for sampling of foreign processed foods, it would specify procedures for entry of food imports. It would also establish dumping of products by foreign producer wherever applicable and may also prohibit

import of products or seeds prepared through genetic engineering, which have not been approved by the government.

The proposed authority is expected to be headed by a chairman, who has held an office of a rank not less than a secretary. With the commencement of the Act, the Union government would also set up an Equalisation Fund Authority to administer the equalisation fund. It also plans to strengthen existing laboratories like the Defence Food laboratories, Central Food Technological Research Institute and other well-known laboratories for certifying standards of food products.

The proposed changes come at a time when various studies have shown that there is a huge potential for investment in the sector.

Economic Times

17.1.2001



Chinese milk set to enter market via Dabur venture

Holy cow! This milk is from China.

Not content with flooding the Indian market with cheap, manufactured products, the Chinese are now flooding the Indian market with cheap natural products.

Dabone International Ltd, the 50:50 joint venture between the Burmans-promoted Dabur India Ltd and Bongrain International SAS,

France is test-marketing the Le Bon brand of flavoured milk in the country.

The product, available in cute milk-can shaped plastic packs, is however, being manufactured and packed in China.

The Tianjin, China-based Friesland Tianjin Dairy foods Co Ltd, is making the sterilised flavoured double toned milk under supervision of Friesland Dairy Foods, Holland.

Tianjin (a two-hour drive from Beijing) is one of the fastest growing industrial townships in China, and hosts modern factories of some of the most high-profile MNCs in the world. Several Chinese consumer electronic products, toys, etc which are being "dumped" in the Indian market are made in this industrial province.

But why imported milk? Dabone International officials say the product is only at the test marketing stage.

"Hence, we are importing milk from a unit producing the same product in a neighbouring country", they add.

They point out that the packaging technology required for the milk is not available in India. Translucent plastic packs are being used so that consumers can see the product.

This is because the manufacturers feel consumers attach

a great deal of importance to the "freshness" of milk.

"We will require an investment of at least Rs 10 crore for the packaging facility," they said, adding that, when the business plans are finalised, the existing Noida factory, which manufactures Le Bon cheese and other milk products, can be upgraded at a small cost to make flavoured milk as well.

The 100 ml pack, which has a shelf-life of nine-months, bears a price tag of Rs 12. And there are three flavours currently on sale-chocolate, strawberry and banana. The company says its business plan is not ready yet. However, the response to the product is very encouraging.

Analysts add that Indian companies will increasingly import products from China, even if it is in the garb of test marketing. Imports will continue further if the business succeeds.

A manufacturing unit may be the least considered option now.

Business Standard

18.1.2001



Fruits from NE get development thrust

Apple lovers in Guwahati and the rest of the North East may well have been having the fruit cultivated in the region itself, mostly in Arunachal Pradesh, though the fruit-

sellers may have been passing it off as apples from Kashmir or Himachal Pradesh. That few have realised the fact only goes to show that there is very little to differentiate between apples produced here and that imported from the northern States.

The only difference, if there is any, is that apples from Kashmir and Himachal have enjoyed a better profile than their counterparts from here. But that could well become a thing of the past with the Agricultural and Processed Food Products Export Development Authority (APEDA), an agency under the Ministry of Commerce, deciding to accord apples from the region their fair share of the limelight.

"There is no difference between apples from here and those from other parts of the country, whether in taste, colour or even size," says APEDA field officer here Bidyut Baruah. APEDA has selected apples, along with some other distinctive fruits of the region, for a development thrust. It will be promoted along with kiwi fruit, walnut, chestnut, oranges, pineapples, etc.

Arunachal Pradesh is the one State in the region that has the best prospects for apple cultivation. Apples thrive at altitudes above 8,000 feet and that State has been lucky to have vast areas falling in that category. In fact, the state produced the first commercial variety of apples

way back in 1960 in West Kameng district. According to an APEDA study, there is good potential to grow the crop in Ziro, Tawang, West Kameng and Anini of Dibang valley.

In the past year alone, West Kameng district produced 479 MT of apples. According to the Food and Agricultural Organisation (FAO) estimate, apple production in India during 1998-99 was 1.3 MMT. According to Baruah, there is enough scope to increase apple production in the region several fold. A considerable part of that production could even be exported. Countries, in the periphery of the North East, like Bangladesh, Nepal, Thailand and Malaysia, are among the major importers of apples.

It is to bring about awareness about the immense potential of apple cultivation among the farmers that a workshop on apple and kiwi fruit cultivation is going to be organised soon at Bomdila by the APEDA. "The farmers have to be educated on the proper techniques of cultivation and care of the crop," says Baruah. APEDA would also try to encourage financial institutions to advance loans to farmers interested in apple cultivation. It plans to bring experts from major apple growing states like Himachal Pradesh to train the farmers of the region in pre and post harvest care of the crop.

Assam Tribune

18.1.2001



Irradiated food does not lose its nutritive value : scientists

Food irradiation does not lead to cancer. In fact, several hospitals abroad serve irradiated food to cancer patients," stated Sudha Rao, scientist at the Bhabha Atomic Research Centre (BARC).

Debunking the myth that food irradiation is hazardous to health, she said the BARC had recently started serving irradiated food in its hospitals and canteens.

Dr Rao along with her colleagues, S.P.Kale and D.P.Bongiwari, was speaking at a seminar on "Irradiation of Foods" organised by the consumer & civic affairs committee of the Women Graduates Union in association with the Indian Scientists Association last week.

At the seminar, the scientists sought to debunk several other myths associated with irradiated food. "Contrary to popular perception, food irradiation does not decrease its nutritive value," noted Dr Bongiwari. According to him, at low doses of radiation, nutrient losses are negligible. There are also no significant changes in the appearance, smell and taste of irradiated food items.

Listing the uses of food irradiation, Dr Kale said it extended the shelf life of food products,

delayed the ripening of fruits, inhibited sprouting in tubers and bulb crops and enhanced safety by killing food-borne parasites. "On commercial front, irradiated food with its longer shelf life can help in reducing consumer prices and in checking price fluctuations either due to glut or seasonal shortage," he observed.

Times of India

18..1.2001



Now, imported products need to meet Indian standard

This is an Indian answer to the nontariff barriers of US and Europe against the import from India. Call it red-tapism or protection of national interests, Bureau of Indian Standards (BIS) has decided to strictly implement Indian standards to the wide range of imported products.

India would no more be a dumping ground for the second grade low quality goods from the developed countries, said a government official. "BIS may impose any condition to ensure compliance of products to give Indian standard including a visit to the original product manufacturer's premises to assess their process quality controls," said a BIS notification.

The products on the list of 131

categories cover a wide range from infant milkfood to cement, electrical appliances, gas cylinders, food preservatives, additives, plastic feeding bottles, medical x-ray equipment and stainless steel sheets.

"It is a good sign that the impact is being felt by the importers," said a government official. The commerce ministry has already notified that importers should be registered with the BIS and obtain a license.

In addition to the license charges, the licensee will have to pay annual marketing fee of \$ 2000 US plus one per cent of the invoice price of the imported product.

It means that a BIS inspector can visit the plant of a milk powder manufacturer in Netherland to check whether the process adopted by them to manufacture the products are adhered to Indian standards.

Like a domestic manufacturer who bears the cost of B I S inspectors visit to his plant to certify his product, overseas manufacturer will have to foot the bill for travels and accommodation expenses.

This has pleased the Indian manufacturers as the law has created a level playing field with the domestic manufacturers, "The US Food and Drug Authority officials come to India to check quality of our marine products before exports. The only difference is, they charge the cost of visiting India through licence

fees, whereas the cost of inspection here has to be borne by the firms," said an industry captain.

"It is a good methodology to curb import of cheap goods. But, BIS should not misuse its power to harass importers," commented a senior CII official.

"This would stop the import of inferior and cheap food products. It will also have a positive impact on pirated products selling in the country," said a chamber official.

However, it has irked a section of importers who are finding it difficult to digest BIS's latest prescriptions. "They have asked us to set up a fully equipped lab in India for testing product conformity to Indian standards," said an importer. But BIS officials maintained that a manufacturer doesn't have to set up an office in India if BIS enters into an MOU with foreign governments.

"A large number of products are getting jammed in various customs entry points," said an importer. "The import of cement is already getting delayed. We would request the government to delete cement from the list of items requiring BIS certification," said a cement manufacturer. He ascribed this as reason for the recent hike in cement prices.

Times of India

23.1.2001



US FDA allows labelling of bio-engineered food optional

Agricultural biotechnology companies have received a major boost from the US Food and Drug Administration, which has left it to the manufacturers to decide whether or not to label bio-engineered foods. However, it has proposed mandatory reviews for crops derived through biotechnology on January 17.

The proposed rules came after three public hearings and more than 50,000 written comments. The agency will accept comments on the rules for another 75 days before deciding whether to adopt or revise them. Informed sources say since 1992, around 50 crops have been produced using genesplicing techniques, that add pest resistance traits to corn or cotton.

A Monsanto press release issued here on Monday says, according to Mr Joe Levitt, director of the FDA's office of food safety his agency's scientists, backed by a recent federal court ruling believe biotech crops are not substantially different from crops developed through traditional breeding.

"Our job is to create a (review) process to make sure of this on a case-by-case basis," Mr Levitt said, adding that under the new rules.

"FDA would make a judgement, that the new product derived through biotechnology is as safe as

its conventionally grown counterpart", Monsanto explains that there are two parts to the FDA proposal.

First, it would require companies to show FDA regulators safety data, at least 120 days before they bring a new bio-engineered food to the market. However, biotech developers have been showing their food safety tests to the FDA, since these crops started coming on the market. Secondly the agency laid out guidelines for voluntary labelling, that spell out which words can and can't be used to describe biotech crops, Mr Levitt said and added that the agency has proposed that any label specify whether the food is derived through biotechnology".

The FDA's position, it is claimed, has been that mandatory labelling is unnecessary, once the agency has determined that a bioengineered food is safe.

Dr Jane E Henny, the FDA commissioner, has said that "These initiatives will assure that all food products developed using the tools of modern biotechnology are known to FDA, so that it can continue to examine these products before they reach the market. These measures will permit the review process to be more transparent to the public, one of the primary issues voiced during FDA's public hearings on this issue.

Financial Express

23.1.2001



Tariffs, quotas to ward off cheap milk imports : farm ministry

The agriculture ministry today claimed to have taken adequate measures to protect local milk producers from undue competition through imported milk and milk products. It said apprehensions about cheap imported milk and its products flooding the Indian markets were baseless.

"The imposition of quantitative and tariff quota duties will well safeguard the interest of the Indian producers even if multinational companies import their subsidised milk and milk products," the ministry said in a statement issued today.

It pointed out that international prices of skimmed milk powder (SMP) and butter oil were higher than the domestic prices. The imports of these products in 1990-2000 were less than the previous year. The sudden spurt in the imports towards the latter half of 1999-2000 was due to fall in global prices and subsidies on production and exports of dairy products by developed countries like the US and EU. The negotiations held with US, EC and Australia in December 1999 resulted in an agreement to enhance the bound rate of duty on dairy items to 60 per cent and fixing a tariff rate quota of 10,000 tonne on global basis at 15 per cent duty.

Business Standard

25.1.2001



Food processing to be revamped

The Union ministry of agriculture is all set to herald radical reforms in the regulatory regime of the food processing sector, by bringing in a single enactment covering all aspects connected to food products replacing the existing multiple laws.

A draft bill on the proposed Processed Food Development Act is likely to be introduced in the budget session of the parliament. If the proposed Act comes through, it would help replace the existing 14 multiple laws shackling the industry. "These Acts are oblivious of various developments in science, disciplines of food microbiology, food chemistry, food-technology and various trade developments that have taken place in the last few years", a policy paper of the ministry said.

The policy promises to herald a new era of "infrastructural development, establishment of backward and forward linkages, besides special provisions in the north-eastern regions, hilly areas and islands". As part of its effort to create the enabling environment, the policy calls for "harmonisation and simplification of food-laws by an appropriate enactment to cover all provisions relating to food products so that the existing system of multiple laws is replaced and also covering issues concerning standards,

nutrition, merit goods, futures marketing, equalisation funds, etc.'

As part of its thrust to develop infrastructure, the policy promises to set up cold chains, packing facilities, quality upgradation. Application of biotechnology and remote sensing technology would be employed to speed up the development of the sector, besides setting up area-specific agro-food parks and units capable of processing a cluster of trans-seasonal products.

"Sustained linkages between farmers and processors, development of futures market to ensure minimum price stability, mechanism to reduce farm gate price and final consumer price and setting up of an equalisation fund to ensure sustained supply of raw material at a particular price level are the major steps envisaged for the setting up effective backward linkages". the draft says.

Financial Express

26.1.2001



'Food sector must focus on quality'

The food sector must focus on reducing the cost factor by increasing productivity and optimising economies of scale while paying special attention to issues relating to quality.

This was stated by Dr. C.P. Thakur, Union Minister for Health and Family Welfare, while

inaugurating the Fourth Food Industry Summit on 'Intensification of agro-processing in India-Fresh dimensions of export hurdles and import rationalisation,' and 10th AGM of the Confederation of Indian Food Trade and Industry (CIFTI) here on Thursday. The CIFTI web site was also launched by the minister.

Dr Thakur said world over there was a growing concern regarding food safety. Food safety was being given increasing priority among public health problems, particularly in the developed countries where consumer expectations were high and regulatory systems had been well-developed over the years to meet these expectations.

The concepts of hazard analysis critical control points (HACCP) within the range of 'farm to fork' or 'stable to table' were issues that some of the country's export-oriented units have had to address in their attempts to retain and increase their market access abroad. These concepts had posed major challenges to the Indian industry.

Dr Thakur said that domestic industry was yet to address itself seriously to basic quality issues like the concept of mandatory good manufacturing practices (GMP), let alone a more elaborate system like HACCP. This was crucial in the emerging scenario that did not allow the country to have different standards for domestic products as

compared to imports, he said.

This difference in standards could also be a significant drawback in the agricultural sector where the lack of compliance with quality controls in the domestic sector could adversely impact exports too. "We are yet to address ourselves seriously to the issue of credibility that comes in the wake of compliance with quality standards and enhance customer confidence in our domestic products," he said.

Business Line

26.1.2001



It's a lemon

When you ask for a cola, are you under the impression that you're ordering fruit juice? If your answer is no, it will surprise the government immensely. India's nanny state requires cola makers to certify that their concoction contains no fruit juice on every bottle or can sold. One possible reason for this could be

taxation. Under India's irrational tax regime, cola makers pay 40 per cent as excise duty- now called Cenvat for some obscure reason-to the central government. This is the highest rate of excise duty-guns, pianos and pleasure boats attract lower rates. Fruit juices are taxed at 16 per cent, so the stipulation for cola-makers to certify that their products contain no fruit juice, could have been intended for taxmen who would not otherwise figure out the difference between Coca Cola and apple juice. For the benefit of these folks, cola companies anyway write the required lines on bottle caps. This, apparently, is not enough. The government thinks that consumers don't get to read this deathless prose because the caps are thrown away before the cola is drunk. It now wants cola makers to plaster their bottles with 'no fruit juice' slogans.

This will be costly. Reprinting bottles or replacing all older bottles with new ones will need investments worth Rs 600 crore. This is a classic

example of waste imposed by silly regulations. If the 'no fruit juice' declaration is required for tax inspectors, then having it on the cap will suffice. Taxmen are not supposed to be drinking while at work; they can look at cola bottles with the cap intact while making tax demands. In any case, all this trouble happens because colas are taxed higher than fruit juice. The government should end this nitpicking tax regime by bringing in a full fledged value added tax (VAT) regime. If the government wants the 'no fruit juice' caveat for consumers, then it is seriously underestimating the intelligence of Indian buyers of fruit juices and colas. Nobody who orders apple juice can be fooled with a cola instead. No one buying a cola thinks he's purchasing fruit juice. A simple opinion poll will help settle the issue. The government should desist from these farcical regulatory moves.

Economic Times

26.1.2001



Testing/Quality Evaluation of Food and Agriculture Products

Arbro's Food Testing Centre have good facilities in testing of Food Products with reference to various standards and food laws. The centre is also certified under ISO-9002 and has all the modern sophisticated instruments like HPLC, HPTLC, GLC, AAS, UV-Visible Spectrophotometer, IR etc. The centre can be contacted at Arbro Pharmaceutical Limited, 6.V14, Kirti Nagar Industrial Area, New Delhi - 110015. Tel. 5467228, 5150437; Fax-91-11-5463784; e-mail: info@arbro.net. Website:www.arbro.net.

INDUSTRY NEWS

Bix goes bananas

FMCG distributor Diethelm Singapore's Healthcare Division is betting that a blend of what is perhaps Asia's favourite fruit and the growing appeal of cereal breakfasts and snacks will draw Singaporeans and other urban southeast Asians to the new Bananabix whole wheat cereal with banana.

Manufactured by Britain's Weetabix Ltd, the cereal, packed in a cheerfully-coloured 500g box, is made from crunchy little banana bits wrapped into mini whole wheat 'biscuits' or bixes, making for a yummy yet healthful, high -in-fibre breakfast delicious with cold fresh milk.

Bananabix is made from whole wheat, banana chips (10 percent), fructose, salt, flavourings, niacin, iron, thiamin, riboflavin and folic acid. Each 100g serving contains 370 kCal, 8.8g sugar, 8.1g soluble and non-soluble fibre and 73g carbohydrates.

Asia Pacific Food Industry Nov.-Dec.2000



Marico Industries plans to grow 'Sil' franchise into more food categories

MARICO Industries is evaluating

plans to grow the "sil" franchise into more food categories. Sil, which is currently perceived to be a product in the jams market, has a tremendous potential for growth, the company feels.

Besides jams, Sil is also present in baked beans, mayonnaise, chillisaucers, soya sauces and such urban-centric categories. However, consumers are not much aware of the presence of Sil in these categories. We are evaluating options of growing Sil franchise into other food categories where Sil can be built into a strong number one or number two brand. Sil bears an immense scope for growth into the non-jam food categories as well, said Marico Industries CEO (healthcare division) Pranab Datta. Marico is expected to commence the exercise of identifying which markets Sil can be further extended to by early next year.

According to industry consultants, Sil has been overtly associated with jams and the performance of the brand could stagnate if the equity is not stretched to other non-jam food markets, and the portfolio not expanded.

"The segments in the foods market are very fragmented and most of these markets are small in value. We will have to identify the

right type markets for Sil. We do not want to get into crowded food categories like snacks" said Mr. Datta. The jams market for, instance, is valued at about Rs. 80-90 crore. The noodles market value stands at Rs.150-200 crore. Sil jams on its own has been performing well. It was relaunched last year under a new packaging and a new formulation with glucose.

As a result, Sil's market share in the jams category during the year increased to over 12 per cent from about 10 per cent in the previous year. Sil recorded a turnover growth of about 29 percent in 1999-2000. Over the previous year. Sil contributes less than 5 per cent to Marico's total turnover of Rs. 648 crore. This restricts the company's expenditure on advertising and promotion for the brand, which cannot stretch beyond a limit.

Financial Express

25.12.2000



IFF to acquire Bush Boake Allen, initiates reorganisation

INTERNATIONAL Flavors & Fragrances, Inc (IFF) has said it will acquire all outstanding shares of Bush Boake Allen (BBA) for US\$970 million in cash.

According to IFF, the move will create the no.1 company in the world for flavours and fragrances, with an annual revenue of approximately US\$1.9 billion. Current BBA chairman, president and chief executive Julian W. Boyden will join IFF as executive vice president reporting to IFF chairman and chief executive Richard Goldstein.

Soon after news of the acquisition, IFF announced a major global reorganisation to restructure the company around broad umbrellas of Business Development and Operations, rather than separate divisions for flavours and fragrances. Both umbrella groups will work with and support Regional Managers in a new matrix structure.

In November, IFF opened a US\$5 million Regional Technical and Creative Centre in Singapore, which will serve as the company's headquarters and support hub for the entire Asia Pacific.

Asia Pacific Food Industry Nov.-Dec. 2000



FAO patents Coconut water bottling technology

THE UNITED Nations Food & Agriculture Organisation (FAO) has obtained a British patent for a newly-developed technology that would allow manufacturers to bottle coconut water that is biologically pure, tasty and full of natural salts,

sugars and vitamins demanded by athletes.

The patent is the first ever given to a UN agency and similar requests in Canada and Japan are pending. The FAO hopes that the technology would benefit developing countries heavily involved in planting and processing coconuts.

According to the FAO, the nutritional properties of coconut water could not be preserved prior to the development of the new technology. Coconut water is mainly consumed fresh in the tropics, as the liquid loses its nutritional characteristics and starts to ferment once exposed to air. Food manufacturers, however, have long been interested in the viable production of coconut beverages, as a by-product of coconut cream processing and coconut desiccation.

Present processing methods involving thermalisation similar to UHT milk treatments are said to eliminate the coconut water's nutrients and most of its delicate flavour, along with bacteria. This greatly reduces the product's marketability. Morton Satin, chief of FAO's Agricultural Industries and Post-harvest Management Service, said, "Coconut water had a future only if we could invent a cold sterilisation process that retained its flavour and all its nutritional characteristics."

Satin revealed that the secret laid in microfiltration technology using a medium such as polyacrylic gel or

porcelain. The filter membrane retains micro-organisms and spores, rendering a commercially sterile permeate.

Four coconut varieties were used in the testing of the technology, which Satin said would be made available to all interested companies. "Companies in the beverage industry have already shown interest," he said.

In particular, Satin believes coconut water has strong potential as a natural sports drink. He said: "A young coconut between six and nine months old contains about 750 ml of water. It's natural isotonic beverage, with the same level of electrolytic balance as we have in our blood. It's the fluid of life, so to speak."

Sports Drinks Vs. Coconut Water

| Component | Sports drink (mg/100ml) | Coconut water (mg/100ml) |
|-----------|----------------------------|-----------------------------|
| Potassium | 11.7 | 294 |
| Sodium | 41 | 25 |
| Chloride | 39 | 118 |
| Magnesium | 7 | 10 |
| Sugars | 6 | 5 |

The FAO research team processed coconut water with added sucrose and L-ascorbic acid to approximate the vitamin and energy content of commercial sports drinks. Discoloration occurred in water from one coconut variety, which turned pink, but transparency was restored by adding lime juice. A panel of tasters also detected no difference between fresh coconut water and the processed product.

Satin sees the coconut water as a natural contender in the world's US\$1 billion sports drink market. "What could be better than a natural beverage product with the delicate aroma, taste, drinking characteristics and nutritional value of pure, fresh, tender coconut water, plus all the functional characteristics required of a sports drink?" he said.

Asia Pacific Food Industry Nov.-Dec.2000



Givaudan opens Indian plant

Swiss flavours and fragrances producer Givaudan Ltd has opened a new Indian plant in Jigani, Bangalore. The new factory includes state-of-the-art fragrance and flavour compounding facilities as well as application and quality control laboratories.

According to Givaudan, the new plant doubles existing production capacities and will enable Givaudan to meet the growing needs of key customers in the fast growing Indian market.

Asia Pacific Food Industry Nov.-Dec.2000



HLL plans foray into confectionery business

The Rs. 10,142 crore FMCG-major, Hindustan Lever Ltd. (HLL) is understood to be exploring the possibility of a foray into the confectionery business. With its

entry into the Rs. 500 crore Indian confectionery market, HLL will take on major players like Cadbury India, Nestle India and Parry's.

The confectionery market comprises chocolates hard-boiled sugar confectionery, chewing gums among others.

The FMCG major - which has a strong presence in other segments like the highly mature soaps and detergents the fast growing personal products, beverage, culinary and ice cream - is said to be studying the option of entering the confectionery business, said industry sources. This will be unique, as parent company, Unilever does not have a presence in confectionery globally.

However, when contacted an HLL spokesperson said that the company does not have plans to enter confectionery as of now.

The move gains significance since HLL has become active on the food market which is said to explode in the year ahead. The company has already marked a significant presence in the wheat business. It is said to be seriously considering entering the water market too.

HLL's recent acquisition of Modern Foods for Rs.105 crore, is expected to see a number of changes in its product profiles in the coming months, industry sources pointed out.

Through the global acquisition of Bestfoods, the niche foods company International Bestfoods

also becomes part of the Lever family with a basket of value added food brands such as Captain Cook, Brown & Polson, Knorr, Rex, Skippy and Glucovita.

Financial Express

09.01.2001



The Royale fruit drink

Weikfield International Corporation, in association with St Dalfour of France, has introduced a new variant, Royale Fig from its burgeoning stable. St Dalfour conserves are made from age-old French recipes from the countryside of Loire. These recipes ensure a delicious, yet nutritious food resulting from the conserve produced. St Dalfour's Royal Fig conserves are pure fruit with no sugar added to it. The natural sweetness of concentrated grape juice is used as a substitute. The fruits are hand-picked and cooked in special pots to preserve their delicious natural taste. This natural sweetness produces a taste that is fresher and delicious than the heavy taste of syrup, say the manufacturers. According to the French Diabetic Association, a diabetic can also consume these conserves.

Mr Mukesh Malhotra, managing director, Weikfield International Corporation, says, "The overwhelming response to launch of St Dalfour's conserves last year encouraged us to introduce the new Royale Fig variant to meet the

needs of the discerning Indian gourmet."

Besides the Royale Fig, St Dalfour conserves are available in 11 other varieties which include apricot, orange, black cherry, peach, black raspberry, plum, blueberry, cassis, red raspberry, strawberry and four fruits. It is priced at Rs. 150 for the 284 gm pack and is available in select retail outlets in the major cities.

Financial Express

15.01.2001



Cherry Burrel to replace Alimenta in Classic Agri

Cherry Burrel Inc of the US is replacing Alimenta SpA of Italy as foreign collaborator in Classic Agrifoods Ltd. a manufacturer of fruit concentrates. Chery Burrel will hold a 50.35 per cent stake, with an investment of Rs.13.10 crore. The resident shareholding will be 25 per cent aggregating Rs 6.50 crore, while non-resident Indians (NRIs) holding will be 24.65 per cent or Rs. 6.41 crore.

The total paid-up capital of the company will be Rs.26.1 crore. The share capital of the venture, in which Alimenta was partnering, was Rs. 30.92 crore, of which 50 per cent (Rs.15.46 crore) was to be held by Alimenta, while NRI and resident shareholders were to hold 25 percent each with an investment of Rs. 7.73 crore.

Classic Agrifoods Ltd. holds a letter of permission (LoP) dated 1993 for the manufacture of fruit concentrates. The validity of the LoP has been extended upto February 1,2001, vide letter dated August 7,2000.

The unit was granted foreign collaboration approval dated February 2,1993, with Alimenta SpA, envisaging foreign equity participation to 23.23 percent, amounting to Rs. 15.41 crore and NRI equity participation to 26.77 per cent amounting to Rs. 17.76 crore on a repatriable basis for the revised paid up capital of Rs 66.32 crore. The company's shareholding pattern subsequently changed.

Subsequent to Alimenta pulling out of the venture, Classic Foods wrote to the government that Cherry Burrel's willingness to step in. The government nod came after getting the clarification that Cherry has no previous technical agreements in the country.

The department of food processing industries has given a clearance to the proposal. The department of economic affairs also supported the proposal and recommended its clearance subject to the Reserve Bank of India permission for retaining an advance of \$3 million and issuance of fresh equity (if any) on swap basis which would require prior approval of the Foreign Investment Promotion Board.

Financial Express

15.01.2001



Amul basket to include more goodies

Suddenly, every FMCG Company worth its salt wants to be a confectioner. After Nestle, Cadbury, HLL, it's now Amul which is warning up for a foray into confectionery.

Gujarat Cooperative Milk Marketing Federation (GCMMF) which was happy making milk-based products all this while is revising its strategy for the year. Having achieved leadership position in dairy products, it now wants to look afresh at new businesses.

Since the low unit price band of chocolates and confectionery is currently witnessing strong growth with both domestic and MNCs plunging into the segment, it's now or never for Amul. It has a token presence in chocolates which has met with limited success. However, with expanded capacity and a good distribution network, GCMMF thinks that the segment can prove to be a money spinner. Hence efforts are on to push forward as many low-priced chocolate brands as possible in the next few months.

The confectionery market which is estimated at Rs. 1,000 crore approximately and is understood to be growing much faster than chocolates is another focus area. Nestle, Cadbury, Perfetti are the majors while there are a host of small players doing brisk business. And now big daddy, HLL, is

becoming a confectioner. Hence the time is just right for Amul to swarm the market with sugar boiled and hard boiled goodies.

Eclairs, wafer chocs and enrobed chocs will be the first to enter the market, Industry experts say that GCMMF will try to keep the prices low to capture the mass market sentiment. Being a late entrant, it has learnt from the mistakes of its competitors who have struggled to bring down prices after having launched high priced packs. Some of them have even relaunched their existing products in miniature packaging. "We are working towards having a good presence in the low priced category which has the potential of generating huge volumes in a short span," Amul officials said.

Analysts say chocolates are mostly an impulse buy, hence consumers would rather prefer small low cost packs to the high-priced ones. Bars priced at Rs. 5 sell significantly higher. Nestle's Munch, Bar One or Cadbury's Raillis are great hits because they are priced in the Rs. 5 band, industry watchers point out.

This is precisely why Nestle launched Munch in the Rs 5 band and effected price cuts for its popular Kit Kat chocolates. According to analysts, it is a well calibrated effort to expand the market. With Amul trying to include chocolates and confectionery as core competency areas, some tough fight is expected in the market.

Amul's chocolate capacity has gone up considerably after its tie up with Campco. It plans to expand it further by getting into several such arrangements with other cocoa-beans producing cooperatives.

Economic Times

18.01.2001



Pepsi uncorks Dole juices

PEPSI-COLA Co has unveiled a line of Dole single-serve juices, signalling its latest move to expand its presence in the booming non-carbonated beverage business.

Pepsi-Cola is owned by Purchase, the New York-based PepsiCo Inc, which also owns Tropicana Products Inc, the world's largest branded juice maker, and snack chip giant Fri-to-Lay Co.

According to Pepsi-Cola, single serve juices and juice-drinks were the largest category of non-carbonated beverages in the United States, with retail sales topping \$5 billion. Pepsi-Cola will sell Dole drinks such as Apple, Orange, Pineapple-Citrus, Ruby Red Grapefruit and Cranberry Juice Cocktail in 16-oz plastic bottles and 11.5-oz cans.

Tropicana, which acquired the rights to the trademark for Dole's chilled line of blended juices back in 1995, was acquired by Pepsi Co in 1997. The trademark is licensed from Dole Food Co Inc in connection with single-serve juices.

Pepsi-Cola previously distributed

single-size servings of Ocean Spray juice drinks from 1992 through 2000, but the company's agreement with Ocean Spray ran out on December 31, 2000.

Pepsi-Cola noted that while Tropicana's research and development unit helped create the juices, Pepsi-Cola was distributing the drinks.

The Dole drinks come in cans and bottles suitable for distribution in vending machines, while single 16-oz servings of Tropicana juices come in cartons. A company spokesman said Pepsi-Cola currently has no plans to sell the drinks in cartons.

Pepsi-Cola's other non-carbonated drinks include Aquafina bottled water, Lipton ready-to-drink tea, Starbucks Corp's Frappuccino bottled coffee drinks and Fruit Works fruit drinks.

Last week Pepsi Co bought 90 percent of South Beach Beverage Co, giving it a stake in the market for such new-age beverages as exotic flavored teas and enhanced fruit blend drinks.

Last month, PepsiCo announced plans to buy Quaker Oats Co which makes the coveted Gatorade sports drink.

Business Line

10.01.2001



Veekay Foods plans a splash with water brands

As scores of mineral water brands vie for shelf space, Apollinaris

is trying to make a splash in the Indian market.

The entry of the natural sparkling mineral water brand, positioned as The Queen of Table Waters worldwide, comes close on the heels of Nestle's launch of its premium sparkling water brands, Perrier and San Pellegrino.

Apollinaris is being imported and distributed by the Mumbai based Veekay Food & Beverages Ltd.

Realising the limited market for such a product, Veekay is targeting foreign tourists and expatriates in India to buy the brand in its first year of launch. It is available at select retail outlets in Mumbai and Delhi under the Apollinaris Classic brand. A separate sub-brand, Apollinaris Private, is simultaneously being launched to take care of institutional sales (mainly to big hotels) in Chennai, Kolkata, Goa and Rajasthan.

Explains Mr. Viral Mehta, Managing Director, Veekay Food & Beverages Pvt Ltd, "We will sell the brand through an educational campaign and position it as a sports-oriented one. The idea is to highlight the difference between still bottled water and mineral water, and bring out the goodness in the latter".

The company will soon unleash an advertisement campaign, developed by the Mumbai-based agency, MX with a new set of health- and sports-related taglines. Boasting of a "perfect balance of essential minerals". Apollinaris is

also being launched under the sub-brands, Big Apple and Lemon, targeting children and health freaks. With a combination of 60 percent apple/lemon juice and 40 per cent natural sparkling mineral water, the brand is hoping to replace the carbonated high-calorie cola as a healthier option with natural fizz. Unlike its mineral water products which will have a restricted retail presence, Big Apple and Lemon will be made available in 20,000 outlets across the country.

"Since kids tend to like colas due to its effervescent qualities, substituting the same with our sparkling products might work," says Mr. Mehta.

However, Apollinaris, has been positioned as a premium brand, with a 750ml Big Apple bottle being pegged at Rs 99 and the 1 liter Apollinaris Classic sparkling water priced at Rs. 90.

Apollinaris derived its name from Georg Kreuzberg, a viner from Bad Neuenahr in Germany in 1852, who discovered a mineral spring at the foot of his vineyard. He named it in the memory of the St. Apollinaris shrine that was near the spring.

Veekay has also signed an agreement with the Iceland based Thorspring Iceland for importing its still water brand, Iceland Spring.

The company is also considering forging an alliance with an Indian mineral water player to either get its distribution rights or pick up

a stake in the company.

Apart from selling mineral water, Veekay is also planning to foray into the food business. It is weighing options of tying up with MNCs for launching diabetic food. A new brand of convenience fuel, Carry Heat, is on the company's immediate agenda. Veekay is planning to launch a milk-based product, QimiQ. The company is allying with dairies such as Emmi in Switzerland, Hama in Austria, Express in the United Kingdom and Meggle in Germany to import this food base, that is made under patented procedure and is free of chemicals.

QimiQ is said to replace gelatine, oil, egg and cream, either partly or completely, with no curdling or flaking. Besides, there is no fluid loss or discoloration. The product was launched about a year back in many parts of the world.

Says Mr Mehta, "Initially, we will be importing this brand. But we will start manufacturing it in a joint venture with an Indian dairy". In fact, the company is training chefs at 5- star hotels to use and, at the same time, market the brand.

Veekay has also instituted a QimiQ Trophy to award chefs who can successfully familiarise people with the brand. Recipe booklets with Indian dishes will be issued with the brand once it is made available in the Indian market. The brand will be sold at both the institutional and retail levels. "After all, it can be used as base from *malai*

kofia to chocolate mousse," claims Mr. Mehta.

Veekay Food & Beverages intends reaching turnover of Rs 250 crore in the next two years with the various brands under its belt.

Business Line

25.01.2001



MTR to which up ice-cream market

Convenience food product giant, MTR Foods, which made a quiet entry into the ice-cream market in Bangalore, is planning to shortly reachout to consumers throughout the state. As part of this plan, MTR icecream parlours may also be on the cards.

MTR Foods is planning a statewide rollout. "Softee is quite well-known in Bangalore, we plan to make it available in the major towns and cities of the state over the next 4-6 weeks", Mr P Sadanand Maiya, chairman and managing director of the company told ET.

Currently, Softee is available in 96 outlets in the city. To ensure that larger quantities of ice cream is stored, MTR plans to make available deep-freezers at all outlets. The company, Mr Maiya added, was in talks with major retailers in Bangalore for stocking Softee. While Mr Maiya was not willing to disclose the number of outlets that MTR Foods planned to target, it is expected to increase this by 50 percent, well

ahead of the main consuming season-"summer".

Industry sources also indicated that MTR Foods may be investing money in developing a chain of "ice cream parlours".

The company sells a variety of ice-creams with interesting ice cream varieties like "Crazy Cones", "Gadbad" and Chocoba". Referring to the ready-to-eat products, which were launched recently in Bangalore, Mr Maiya said, the company planned a major roll-out of the product by targeting select outlets in Karnataka.

Economic Times

27.01.2001



Unilever sells dry soups to Campbell

ANGLO-DUTCH consumer products group, Unilever Plc, has sold some of its European soup and sauces businesses to Campbell Soup Co. for one billion euros (\$925m). Unilever is selling the businesses to meet concerns raised by European regulators after its acquisition last October of US-based Bestfoods, owner of Knorr soup, for \$21.3bn.

"We do think it's pretty good price," a London - based food industry analyst said, adding that the sale was concluded swiftly. Unilever stock was barely changed at 507-1/2 pence at the opening. The businesses being sold generate annual sales of about 435m euros, and

include instant soup brands, Batchelors of the UK, Royco of France and Belgium, and Heisse Tasse of Germany. They also include the Oxo brand in the UK and Ireland, and France's Leisure mayonnaise. With the deal particular to the European nations, it is not likely to have any impact on Indian operations at Hindustan Lever. Said a HLL spokesperson : "It does not concern our operations in India at all"

With the global takeover of International Bestfoods (IBL) by Unilever in June'00, HLL and IBL have already formalised a joint selling agreement.

Business Line

31.01.2001



Vlasic to sell pickle business to Heinz

VLASIC Foods International Inc has filed for bankruptcy and agreed to sell its core pickle business and Open Pit barbecue sauce line to leading global food maker, H.J. Heinz Co, in a court-supervised auction for \$195 million. The deal is expected to help debt laden Vlasic, based in Cherry Hill, New Jersey, emerge from bankruptcy. It will increase Pittsburgh based Heinz's presence in the condiment aisle. Heinz expects the deal to close in three months.

Vlasic, which was spun off from Campbell Soup Co three years ago, is also expected to sell its Swanson frozen dinners business, analysts said.

That would leave Vlastic with no more US brands. But with frozen foods and canned vegetables units in Britain.

Heinz will maintain the Vlastic brand name on the pickle line, although Vlastic the company will not be required to change its name, the Heinz spokesman, Mr Michael Mullen, said.

Vlastic's creditors could reject Heinz's offer, hoping for a higher or better offer, but the agreement with Heinz likely has provisions that would act as a deterrent to competing bids.

Heinz, which is best known in the US for its ketchup and also produces Star Kist tuna and Oreida potatoes, is likely to have better cost controls than Vlastic, which could help financial performance in the businesses, said Ms Jaine Mehring, food industry analyst at Salomon Smith Barney. "I can't imagine that Heinz wouldn't be able to instantly improve the margins," she said.

Wall street analysts said they had expected Vlastic to file for bankruptcy. The company has been burdened with a heavy debt load ever since its spin-off from Campbell Soup Co in 1998.

"The company was saddled with a lot of debt and unfavourable operations. We thought it was prudent for Campbell's to make the divestiture, but for Vlastic it's been a tough go since the beginning," said the analyst. Mr . Patrick

Schumann, of brokerage Edward Jones.

Business Line

31.01.2001



Coca - Cola to launch Maaza brand extensions

Coca - Cola India is planning to extend the Maaza brand from mango flavoured drink to other fruit-flavoured variants of non-carbonated soft-drinks.

"We expect to launch Maaza in different fruit flavours such as pineapple, etc. by the year-end," Alex von Behr, president and chief executive officer of Coca-Cola India, said.

The company, a subsidiary of the world's largest carbonated and non-carbonated soft drink maker, Coca-Cola Company, is working with domestic firms engaged in flavour research to develop the new products. The new flavours, currently undergoing mouth feel tests, are likely to be launched initially in small paper box packages.

Research in India is also being co-ordinated by Coca-Cola's own research lab in Japan, von Behr said.

Coca-Cola acquired Maaza in 1993 from Ramesh Chauhan-promoted Parle Drinks, as part of a brand portfolio acquisition which included the cola drink, Thums Up, Gold Spot (orange tangy), Limca (cloudy lemon) and Citra, and forced

its re-entry into the country. Since then, Maaza has continued to remain a non-carbonated mango-flavoured drink.

Last summer, the product was also launched in small paper box packaging (popularly known as tetrapacks), apart from the glass bottles, thereby positioning it as a direct competition to Parle's own 'Frooti'. Market reports suggest that sale of Maaza went up marginally during the last year because of this new strategy.

More time for arm sought

COCA-COLA WILL apply afresh to the government after six months, seeking more time for its wholly-owned Indian subsidiary, Hindustan Coca-Cola Beverage Ltd., to dilute 49 per cent stake to resident shareholders. The deadline for such equity dilution is July, 2002, as per its agreement with the government.

A proposal filed in December 2000 was rejected by the Foreign Investment Promotion Board (FIPB) which observed that such a proposal could not be considered now since the deadline to meet the condition was almost one-and-a-half-year later.

Coca-Cola has not launched any of its original or other global fruit-flavoured brands it owns in India, though it sells Coke (cola), Fanta (orange tangy) and Sprite (clear lime) alongside the brands in the same flavour categories which it acquired from Chauhan. Its marketing / sales strategy has been based on this dual-brand positioning against

the single brands of rival, Pepsi.

ThumsUp and Limca have been among Coke's largest selling brands in the country. However, Citra and Gold Spot have been low-revenue earners for the company.

Behr said Gold Spot is being promoted in specific markets where the demand has been high. One such market is Goa. The brand is also being pushed in certain other markets such as Gujarat, he said. Kinley brand of water will contribute around five percent of the company's sale in the next year, he added.

Business Line

31.01.2001



Radico to launch 8 PM apple juice

Last year, after the government imposed a ban on liquor advertising on mass media, most liquor majors resorted to surrogate advertising. UB Group has launched Mc Dowell's No.1 soda to promote its whisky, while Gilbey's Green Label is advertising its mineral water. Clearly, the intention is to promote the liquor brand. The Rs.231 crore Radico Khaitan, interestingly, has chalked out a different strategy to promote its 8PM whisky. Soon, the company is launching 8 PM apple juice to leverage its whisky brand.

Says Poonam Chandel, brand manager of 8 PM : "we wanted to create a product category that would be profitable and not just another

product meant to support the liquor brand. "Initially, the product will be test-marketed in northern India. Eventually, the company will launch it in the west and south. " we are looking at big volumes for 8PM apple juice," says Chandel. She explains that Radico Khaitan has especially created a product with an eye on profits. At the same time, it will help in creating high brand recall for the 8PM whisky, says Chandel.

According to company officials, 8PM apple juice is 100 percent natural and clarified with added aroma. Priced at Rs 45, the juice will be available in 750 ml glass bottles that resemble the whisky bottles. However, The exact quantity of the apple juice is 700 ml keeping in accordance with processed foods regulations.

Naturally, the company intends using mass media to promote the brand. Explaining the strategy behind the launch of apple juice. Chandel says that the company's endeavour is to make 8 PM an umbrella brand. "This is a holistic approach to the issue." Says she.

Business Line

06.02.2001



Salted snacks : Frito Lay to puff up sales by adding new variants

PEPSICO'S subsidiary Frito-Lay India is all set to launch about

half a dozen new products this year to puff up its market share in the Rs. 1,600/- crore salted snacks market. Apart from expanding the existing range by adding new flavours and variants, the company also plans to launch new brands in the current year.

Though details are not known, the new launches will be both in the extruded and non-extruded categories of snacks. "We would be launching both finger and palm snacks suitable for the Indian market," a Pepsi spokesperson told The Financial Express and added, "each product is a winner."

In line with that, the company is currently test-marketing its latest peanut based product Lehar Nutyumz in Lucknow, Guwahati, Pune and Ludhiana. The product, claims the spokesperson, is the first of its kind and has a coating of flour and skimmed milk along with spices. The product is being launched in a *nimboo* chilli flavour, in two packs-30gm and 150gm-priced at Rs5 and Rs20, respectively. Lehar Nutyumz is being manufactured by Frito-Lay's strategic partner Bikanerwala, located in Faridabad, Haryana.

The company has, since last year, not only speeded up the frequency of new product launches but also begun to localise the taste to suit the Indian palette. Starting with Lehar Kurkure which the company claims is a big hit in the south, Frito Lay followed it up with the roll-out of Lays Asco- The

American style Cream and Onion-flavoured potato chips.

The Asco flavour-which comes from an imported seasoning with a mix of cheese, onion, cream and parsley-was Prito-lay's first foray of potato chips in the area of dairy / cheese flavours which is a new concept for this category.

Late last year, it entered the non-vegetarian snacks segment for the first time with the launch of Tandoori Chicken flavour chips. It recently added a new brand Twisty Lay to its Frito-Lay family.

Pepsi's snacks foods company already has a long foothold in the Rs 1,600-crore salted snacks market particularly with its recent acquisition of Uncle Chipps brand. Frito-lay India is present through its three brands-Lays, Cheetos and Lehar.

The company claims to have a 65 per cent marketshare in the Rs100-crore branded potato chips market. Uncle Chipps, the market leader about three years ago, now just has about 30-35 per cent marketshare.

The new launches are expected to puff up the company's current volumes by a significant 20 percent in the first year.

The snacks are being produced at PepsiCo's snack food factory at Channo in Punjab which has a capacity of 4,000 tonne per annum. The company's second snack food plant with a capacity of 3,000

tonne per annum coming up at Ranjangoan in Maharashtra will be operational by May 2001. The company has invested about Rs. 35 crore in the plant.

The total salted snacks market is estimated to be worth Rs. 1,600 crore in which Frito-Lay is present through its three brands-Lays, Cheetos and Lehar.

Business Line

07.02.2001



Mohan Meakin plans cornflakes variants

Your good old bowl of whole some breakfast may be in for some surprises. For, the Rs.700-crore Mohan Meakin Ltd (MML) is considering extending its age - old Mohun's brand of cornflakes to other variants.

Confirming this to *Business Line*, Mr Vinay Mohan, Director, MML, said the company was exploring possibilities of adding more products under its breakfast portfolio.

"We are looking at possible extensions of related breakfast cereals. As things stand today, we are observing consumer preferences and tastes," Mr Mohan said.

Apart from Mohan's New Life cornflakes, the other brand marketed under the breakfast foods category is Mohan's Wheat Porridge.

Though the company is yet to

finalise on what possible variants of Mohun's cornflakes it is likely to introduce, these could be in the form of flavour-coated corn-flakes and crispies.

Mr Mohan said it would take any where between six to eight months of waiting and watching, before MML, would arrive at a final decision of what variants it would introduce.

According to KSA Technopak the total breakfast cereal market its estimated at approximately Rs 53 crore (not consumption-led, but off- take based figures).

Mohun's claims 60 per cent share of the organised market and enjoys near-generic status within the category.

For cornflakes, MML has a manufacturing base in Mohan Nagar, Ghaziabad and claims a capacity in excess of 2,500 tonnes a year. While the homegrown Mohan's cornflakes has been on steady turf, the deep-pocketed Kellogg's has failed to generate volumes in the domestic market, primarily on account of premium pricing.

Interestingly. It is Kellogg's and not Mohun's, that has made spirited attempts to grow the western breakfast foods market in India. But despite some heavy-duty advertising and large doses of concept selling on 'healthy' breakfast eating habits, Kellogg's has not been able to make a dent

in the breakfast cereals market.

In addition to Mohun's and Kellogg's the cornflakes market is categorised by several small, regional-level players.

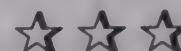
MML is also considering introducing more variants under its fruit juices portfolio. At present the company markets Mohun's Gold Coin Apple Juice, Pure Malt Vinegar and Synthetic Vinegar.

Meanwhile, Mr Kapil Mohan, Managing Director, MML, told *Business Line* that the company could collaborate with multinational players to further promote its cornflakes brand. While refusing to divulge details he said several multinational FMCG giants have been evincing interest in the Mohun's cornflakes brand. He, however, ruled out the possibility of selling the brand.

While Mohan Meakin's core business interest is alcoholic products under several categories, the company's non-alcoholic products include breakfast foods, juices, Golden Eagle and Mohun's mineral water, pure malt and synthetic vinegars, and malt extracts.

Business Line

07.02.2001



FOOD ANALYSIS CENTRE AT BANGALORE



Food Research & Analysis Centre (FRAC), New Delhi have joined hands with Foundation for Food Research and Enterprise for Safety & Hygiene (FRESH), a NGO at Bangalore and established its Regional Centre at Alankar, # 167, Amar Jyoti Layout, Domlur Extension, Bangalore-560 071 on 5th January 2001. Sh. G Gurucharan, IAS, Commissioner for Industrial Development and Director, Industry and Commerce, inaugurated the Centre. During this occasion, captains of industries and representatives from scientific institutions were present.

The Regional Centre will operate under the terms and conditions of MOU signed between FRAC and FRESH. The Centre will work under the technical supervision of a Regional Technical Advisory Committee. Col. O P Kapoor, Former Director-CFL, Mysore, was elected as Chairman and Dr. A S Aiyar as Vice-Chairman.

Initially, the Regional centre is equipped to carry out the microbiological and proximate analysis of all kinds of food products as per national and international standards. The Regional Centre will operate under the technical supervision of FRAC, New Delhi, which is a NABL accredited laboratory and also enjoys the recognition from different government institutions.

The Centre was established keeping in view the present and future demands of food industry and trade in terms of analytical services, training, and consultancy services.

NEW PRODUCTS / MACHINES

Mouthfeel enhancing starches for liquid foods

TWO new starches have been added to National Starch & Chemical's range of starches designed to enhance the mouthfeel characteristics of beverages and thin sauces. Up until now, TEXTRA starch has been used for these applications: however, this cook-up starch is only suitable for heated processes. Now, instant applications have an ideal solution with INSTANT TEXTRA starch and TEXTRA PLUS modified food starches.

Quite often, hydrocolloids are used to give body to thin sauces and beverages, such as flavoured milk products and marinades. However, INSTANT TEXTRA AND TEXTRA PLUS are offered as economical and easy-to-use alternatives for such applications, especially if they are instant or cold processed.

INSTANT TEXTRA starch is simply dry-blended with other dry ingredients such as sugar, and added into the cold mix with agitation if there are insufficient dry ingredients available to dry-blend with, then TEXTRA PLUS starch is recommended as it can be mixed into the cold solution alone. Generally, the recommended usage

level is 1-2 percent to achieve a smooth flowable texture.

Powdered chocolate and coffee drinks can be formulated with these starches to achieve a smooth, creamy mouthfeel, and allow the possibility of reducing fat levels in the original formula. Unlike conventional viscosity building starches, the TEXTRA range does not add significant viscosity : it is simply added to improve the mouthfeel and cling to the liquid product. This makes it ideal for marinades where extra cling is required to hold the marinade to the substrate, rather than sliding off the dish.

Other products that the TEXTRA starches could be used in include:

- Low fat yogurt milk drink to give a creamier mouthfeel that is more characteristic of full fat products;
- Fruit smoothies to add body and suspension properties;
- Canned or aseptically packaged coffee, tea, soybean, coconut or dessert drinks for mouthfeel enhancement and stability;
- Low viscosity sauces such as soy sauce, teriyaki sauce or duck sauce to slightly alter the body, provide sheen and a more flowable long texture;
- Fruit juice drinks to suspend the pulp;
- Dry mix beverages that are mixed with cold or hot milk and water to improve mouthfeel characteristics and
- Low calorie sauces, toppings and syrups that need an extra boost to their texture. Typically, 2-3 percent of TEXTRA starches can provide the textural properties of 20-25 percent sugar.

Asia Pacific Food Industry

Sep.2000



Tea - time treat from Danone

ANOTHER old favourite takes the healthy path, with Danone's Vitamarie biscuit.

Fortified with five vitamins (A, B1,B2,B6 and B12), the amount of protein contained within 100g of vitamarie biscuits is equivalent to that of a whole glass of milk. Mothers can also rest easy that with added calcium and iron, their kids' teeth, bones and blood will be in peak condition.

Sweet and mild, Vitamarie can be taken on its own or in the time-honoured way- dipped in a steaming mug of hot chocolate or coffee. The

biscuits come in yellow and blue packs of 200g each. Vitamarie is manufactured by PT Danone Biscuits Indonesia, and is imported by Britannia Brands (M) Sdn Bhd in Malaysia and by Yeo Hiap Seng Ltd in Singapore.

Asia Pacific Food Industry Sep.2000



Twin temptation on ice

FINALLY, an ice cream for the chronically indecisive.

Nestle's Maxibon is perfect for those days when you just can't decide between a classic chocolate coated ice cream bar or an ice cream soft wafer sandwich. Agonise no more, because with Maxibon you can have your ice cream and eat it.

Made by Nestle Italy, Maxibon is half-chocolate and hazelnut chip coated bar, and half- chocolate biscuit and chocolate chip ice cream soft sandwich. Just looking at this rich, creamy, chocolatey, nutty, vanilla rich, sinful temptation would make any ice cream addict go weak in the knees. And at 100g a bar, it's also substantial enough to satisfy that craving without having to eat more than one.

Maxibon comes in boxes of four bars each and can be found in the frozen snacks section of supermarkets around Singapore.

Asia Pacific Food Industry Sep.2000



Heavenly brew for earthy desires

With Asian tea drinks all the rage, it was only a matter of time before soft drink giant Coca Cola got into the act.

The company's latest product in southeast Asia are the 'Heaven and Earth' oolong and jasmine green teas. Brewed from premium fragrant tea leaves and containing no preservative or colouring, the drink should satisfy thirsty consumers looking for a healthy alternative to carbonated softdrinks. Helping to catch the eye of shoppers is the bold, chinese-theme design on the red and green cans.

Originally a brand introduced in China, Heaven and Earth is manufactured by F&N Coca Cola (Singapore) Pte Ltd.

Asia Pacific Food Industry Sep.2000



Finger -food from coffee specialist Klassno

SINGAPORE based Future Enterprises Pte Ltd., a subsidiary of Empire Food Holdings Ltd. has made its debut into the frozen foods business with fried finger foods under the Klassno label.

The delectable deep fried treats are the perfect solution for parties and as afternoon snacks. Easy to prepare, simply toast or deep fry for 3-4 minutes and the snacks are ready to be served.

Health conscious consumers will be glad to know that Klassno finger foods have no preservatives, no colouring and no added MSG. Made in Indonesia, there are six varieties in the range-cocktail curry puffs, cocktail samosas, butterfly seafood wonton, seafood calamari balls, cocktail vegetarian spring rolls and crispy seafood deli.

Asia Pacific Food Industry Sep.2000



Tea off with fruity blend

FROM Malaysia's renowned Cameron Highlands comes this unusually flavoured instant ice tea-the Orchard Splash Ice Tea from tea specialist Boh Plantations Sdn Bhd.

A refreshing blend of pure tea, fresh green guava, sweet mango, juicy orange and a tangy dash of tangerine, Orchard Splash is a welcome addition to the range of instant beverages on the market. To enjoy it, simply empty the contents of one sachet into a glass of cold water and stir briskly. Add ice if needed.

Aside from the convenience, office workers and housewives will appreciate the added vitamin C, to ward off nasty flu bugs lingering in the office and in school. Every 200 ml of drink contains as much as 200mg of vitamin C, or two-thirds the recommended daily intake.

Consumers can keep and eye out for the attractive metallic packaging. Each bag contains twenty 19g sachets of drink. Boh Peach Ice Tea is also available.

Asia Pacific Food Industry Sep.2000



Sunkist dangles the carrot

DRINK your way to health? Now you can, with Sunkist Premium pasteurised carrot juice.

Every 100 ml of juice is packed with 1,250 IU of beta carotene (vitamin A), as well as vitamins C and E, which help protect the body from damage caused by free radicals. A daily dose of the juice will also help strengthen the immune system and maintain a healthy and glowing complexion. And at just 38 kCal per 100ml, drinkers need not fear that their indulgence will result in weight gain.

Sunkist premium carrot juice comes in jumbo 1.89 litre packs, and can be found in leading supermarkets across Singapore and Malaysia. Also available, in the same range, is Sunkist Premium orange juice. Sunkist Premium is packed in Malaysia for F&N Foods Pvt. Ltd.

Asia Pacific Food Industry Sep.2000



A new ice (cream) age

WAUKESHA Cherry Burrell Ice

Cream's two latest innovations-the revolutionary Cryo-ZAT freezing process and the Versa-line Automatic Stick Novelty System-promise to change the look of ice cream as we know it.

The Cryo-ZAT low temperature ice cream moulding system was developed in partnership with the Air Products Food and Cryogenics Group of Brussels, Belgium. With the system, complex 3D ice cream shapes, including high definition logos, animals and other objects can be created. The system is suitable for sticks, bars, cones, sandwiches and other novelties.

The Cryo-Zat system is based on a combination of cryogenic techniques and Air Product's patented Zero Adhesion Technology (ZAT). Using liquid nitrogen, ice cream moulds are cooled to -196°C. Ice cream freezes instantly on contact with the mould, and the formed ice cream can be easily removed from the mould without warming.

Because of the speed of the process, throughput is automatically and greatly increased. A smoother texture is also obtained, because with super-fast freezing the ice crystals formed are smaller. One Cryo-ZAT equipment will be completed in the fourth quarter of 2000.

For ice cream stick novelty confections, the Versa-line system employs the patented Cascade Freezing System which provides cold brine distribution for efficient freezing, high running speeds and

easy maintenance. Both ice cream and water ice products benefit from the precisely controlled volumetric filling. A simplified product changeover eliminates downtime.

The new mould-rinsing/washing system features improved sanitation, more efficient water usage and independently controllable, continuous or intermittent frequencies. The Versa-line is able to accommodate capacities of 1,500 to 40,000 pieces/hr, depending on product characteristics.

Asia Pacific Food Industry Sep.2000



High capacity strip slicer for potatoes

INCREASED production capacity for plain and crinkle-cut potato strips is now possible with the redesigned GRL Slicer from Urschel Laboratories Inc., specialist in the design and manufacture of precision-engineered food size reduction equipment.

The model GRL minimizes transverse fracturing and feathered edges, thus avoiding product loss and increasing cut length. Potatoes as long as nine inches (229mm) can be fed into the model GRL, to produce uniform slices up to 14mm thick.

By dialling a different slice thickness and changing the crosscut spindles, flat or crinkle strip cuts can be produced. The model GRL featured continuous operation for

uninterrupted production. Cleaning and maintenance are easy with the simplified design.

Asia Pacific Food Industry Sep.2000



Multiple applications at reasonable cost with FTNF flavours

Consumer requirements in food quality and taste are becoming more stringent than ever, while demand for natural products with health-promoting features is on the increase worldwide. This is a trend that flavour producers have to take seriously.

With this in mind, Wild Werke of Heidelberg-Eppelheim has launched a new generation of FTNF flavours. These offer food processors highly concentrated natural flavour extracts with usage levels no higher than those of conventional flavours currently available on the market. The products come from fruit juice concentration process and are further concentrated by approved physical methods.

Cold concentration technologies are used to protect the quality of the flavours, which can be used to restore the flavour in single and mixed juice, and are suitable for use in nectars and spritzers. The FNTF range is also ideal for organic food products, complying with the requirements of various organic food organizations and local authorities. They are produced exclusively from

the named source, are not genetically modified nor irradiated.

From the flavourists' viewpoint, the flavours are an excellent basis for the creation of natural favours for foods and beverages, providing that special touch for a distinctive taste.

Non-alcoholic varieties of flavours from the name fruit together with halal certification are available on request. Kosher is also an option. The extensive range includes apple, strawberry, raspberry cherry, passion fruit, peach, apricot and mango.

Asia Pacific Food Industry Sep.2000



New generation aseptic lines for acidic beverages

FRENCH filling specialist SERAC, global leader in plastic bottles aseptic filling, introduces a pair of new generation aseptic packaging lines known as SERAC Aseptic System 2nd generation (SAS 2), providing more compact, flexible and economical filling of acid or neutral pH food products.

The SAS 2 line IN version is dedicated to high acid drinks (pH below 4.5) such as fruit juices, fruit drinks and nectars, isotonic drinks and flavoured teas etc. The beverage is filled in open necked bottles where the initial level of contamination is controlled.

A universal alternative for both high and low acid drinks like milk, coffee or tea drinks is the SAS 2 line TF version.

Designed for bottles with no control over contamination, the system provides decontamination with a minimum holding time, and still guaranteeing a thorough decontamination of the bottle. Filling speeds of up to 600 bottles per minute on 500 ml bottles can be attained for both versions.

The SAS 2 offers substantial improvement in floor space saving as well as sterilizing agent usage by doing away with treatment tunnels for activation and transfer. A bottle transfer system by neck allows filling in multiple sizes without tooling changes and less operator intervention.

Several SAS 2 lines have already been put into operation in Europe and the USA.

Asia Pacific Food Industry Nov.-Dec.2000



Water Chiller

Mellcon Engineers. Pvt. Ltd has introduced a state-of-the-art skid mounted Water Chiller for cooling from 0.5 TR to 40 TR capacity. The system is compact in design and is provided with a digital temperature controller. The chillers are complete with pump and stainless steel tank, with coil chiller fully insulated. The tank system has distinct advantage over

shell and tube chiller in terms of breakage of coil due to ice formation. The system is fully closed loop with almost negligible wastage of water. Applications across industries include : chemical / pharmaceutical process, plastic processing like injection / blow moulding, extruders, lamination, PP film, rigid PVC pipes, etc, calenders (Plastic and rubber), paper converting and coating chill rolls, plating and anodising, milk / dairy and food products, lubricants / oil cooling and moisture condensation.

For more details write to :
Mellcon Engineers Pvt. Ltd.
B-297, Okhla Indl. Area
Phase I, New Delhi-110020.



Flash Drying System

Thermajet flash drying systems are versatile and highly efficient. Capable of processing even heat sensitive and volatile materials, the system incorporates a broad range of operating temperatures and pressures to allow customization to specific drying applications. These

systems also perform calcining operations with an immediate response time, ensuring instant changes in product characteristics. It produces dry, discrete, deagglomerated product from raw feeds containing up to 95% moisture, often eliminating the need for additional grinding. It features flexible feed capacities and is able to process materials including wet powders, slurries, sludges and filter cakes ; Engineered for laboratory, pilot and full scale production ranging from 10 to 100,000 pounds per hour. It is also capable of integration with virtually any heating system and offered with a variety of control options. Operates reliably with minimal maintenance.

For more details write to :
Fluid Energy Aljet, PO Box 428,
Plumsteadville, PA 18949, USA



Belt-Type Dryer

Nefzech Inc., has developed a continuous belt type dryer mainly to be arranged in line with the fully automatic high-pressure

membrane filter press. The slurry, which has been mechanically dewatered as high as possible, is dried down to a solid content of 90 to 95% using warm air. Depending on the application, the warm air temperature ranges between 70 and 140°C. Thus, the filter cake is dried carefully. As such, an exhaust air treatment is required in individual cases only. The company manufactures these belt type dryers for a water evaporation capacity of up to approx. 600 Kg/h. The high mechanical dewatering degree and the optionally possible heat return with the belt-type dryer makes this an economical dewatering and drying plant. In particular, the dryer is suitable for drying dewatered slurries and suspensions from municipal sewage treatment plants, water treatment plants, industrial waste water treatment plants and process engineering.

For more details write to ;
Nefzsch Incorporated
119, Pickering Way, Exton PA
19341, USA



Consultancy in Quality Management Systems and Human Resource Development (HRD)

M/s D.K.Associate is an Organisation, engaged in providing consultancy services on ISO, TQM, HACCP, etc.

They can be contacted at D.K Associaste, 10/206-207, Sikka Complex, Preet Vihar Community Centre, Delhi-110092. Tele-Fax:011-2432644. Email : dkassociate@ consultant.com
Web Site : <http://dkassociate.itgo.com>.

FAIRS AND SEMINARS

IFE 2001- International Food & Drink Exhibition, London, March 25-28,2001

The above exhibition is being organised by India Trade Promotion Organisation (ITPO). This is one of the largest events in Europe and attracts large number of business visitors from all over Europe. Deptt. of Food Processing Industries and APEDA are jointly participating in this exhibition in order to provide services related to agriculture and processed food segment.

Interested persons /Cos. / Parties may contact : ITPO, Pragati Maidan, New Delhi.



Food Expo-2001, 2-5, April 2001 in Muscat

The Gulf International Agriculture, Fish and Food Exhibition-2001, an international trade exhibition of food and beverages, catering, processing and packaging is being organised at the Oman International Exhibition Center, Muscat, Sultanate of Oman. This International Expo is being supported by the Ministry of Agriculture and Fisheries, Oman.

Interested persons / who wish to participate may contact : Mr. C.J.Paul, General Manager, Food Expo, P.O.Box 20, Postal Code 117, Al Wadi Kabir, Oman, Tel + 968 790333 Fax + 968 706276. or Mr Joseph Kuriacose, Cochin, 315258/320290.



ISO 9000 Lead Assessor Course-April 9-13, 2001- New Delhi

FICCI Quality Forum (FQF) is organising its 111th course of ISO 9000 Lead Assessor from April 9-13, 2001 at Federation House, Tansen Marg, New Delhi-110001. This course is IRCA, U.K. approved and uses ISO-9001-2000 version (Registration No. A 17027) and meets with the formal training requirements for individuals seeking registration under the IRCA auditor criteria.

FQF Lead Auditor training course is a highly rated course in the country. The registration fee for the course is Rs. 15,750/-

Interested persons may contact: Mr. E.N.Sunder, Senior Quality Consultant, FICCI Quality Forum, FICCI, Federation House, Tansen Marg, New Delhi-110001.

Tel-3738760-70(11 lines) 3739947
(Direct) Fax : - 91 - 11 - 3320714,
3721504;

E-mail : pcindia@ficci.sprintpg.ams.vsnl.net.in
WEBSITE : <http://www/ficci.com>.



Training programme on "Production technology for fruit based carbonated drinks and beverages"

The Indian Agricultural Research Institute (IARI), New Delhi is organising a training programme in two batches, one from 14 May to 28 May 2001 and the 2nd from 27 August to 19 September, 2001 to provide information on the technology developed by them on the production of fruit based carbonated drinks and beverages. This is a new technology developed by this institute.

Prospective entrepreneurs and industry members interested in undergoing the training programme may contact Dr. D.S.Khurdiya, Principal Scientist, Division of Fruits and Horticultural Technology.

IARI, New Delhi-110012 Tel. (o) 5788428, 5785214.

The fee for this training

programme is Rs. 5000/-. For those wanting lodging & boarding Rs. 3000/- extra.



**International Trading
Days of Morocco (JCI),
Casablanca, Morocco,
June 23 -July 8,2001**

ITPO is organising a national level participation of Indian trade and industry in the 6th edition of the above exhibition.

JCI is an important annual trading centre, where different business personalities would like to participate.

Interested persons / parties / Cos may contact : Mrs. Mahesh, Manager / Shri G.K.Chopra, Deputy Manager ITPO, Pragati Maidan, New Delhi. Tel. 3371667.



**Macfrut 2001, 3rd to 6th
May 2001, Cesena, Italy**

The Italian Trade Commission (Govt. Agency) in conjunction with

the organisers of MACFRUT 2001 is organising an Indian delegation to this International fair. 15 delegates are allowed to go with this delegation. Members of AIFPA interested in joining delegation may contact : Ms. Shweta Shah or Mr. Trevor D' lima at icemb@vsnl.com.



**Intervitis Interfructa
2001, May 16-20, 2001,
Stuttgart Germany**

The above innovation exhibition for the international fruit juice industry will feature an extensive range of technology for the production and marketing of fruit juice.

For participation, contact :
Messe Stuttgart International
Postfach 103252, 70028 Stuttgart,
Germany
Ph : +49 (0) 7112589-0
Fax : +49 (0) 712589-379
E-mail : info@messe-stuttgart.de.



**Indian Trade Exhibition,
Sao Paulo (Brazil),
September 25-29, 2001.**

Indian Trade Promotion Organisation (ITPO) is organising Indian Trade Exhibition in Sao Paulo (Brazil) during September 25-29, 2001.

Agro processing is one of the major strengths of Brazil and other Latin American countries and in the proposed exhibition India will be having major exposure to identify opportunities for increasing trade, joint ventures, technology collaborations and setting up manufacturing base jointly in India and Brazil for third country exports. Dept. of Food Processing Industries, Govt. of India is examining the possibilities of having major participation in the above event .

Persons/parties/cos. interested in joining may contact Mr. S N Pandey Development Officer, Deptt. of Food Processing Industries, Panchsheel Bhawan, August Kranti Marg, New Delhi-110049. Tel 6493227, Fax No. 6493228.



M/s Sree Sreenivasa Fruit Processing Industry, Nuzvid, A.P have been awarded the Certificate of Merit for their excellent performance during the year 199-2000 by APEDA.

They are active members of All India Food Processors' Association and we congratulate them on their achievement.

GOVT. CIRCULARS

MINUTES OF THE MEETING ON DEVELOPMENT OF FRUITS AND VEGETABLE PROCESSING INDUSTRIES HELD ON 22ND JANUARY 2001 AT 11:00 A.M. IN THE DEPT. OF FOOD PROCESSING INDUSTRIES

Opening the discussions, JS (V) mentioned that the Department was in the process of finalizing the National Food Processing Policy; the Policy provides for enhancing the processing levels from 2 to 10% which is likely to attract an investment of Rs. 140,000 crores in the next 10 years. This investment has to come in various States. The objective of this meeting is to get the feedback from the various Central Government Departments, State Governments, industry representatives and financial institutions which have a role to play in this field about the problems faced by the fruits and vegetable processing industry and what can be done by the Government / various organizations and the industry in this regard.

After detailed discussion, following views emerged : -

- i. Thrust needs to be given for introducing varietal changes to promote processing varieties of fruits and vegetables especially peas, citrus fruits and mango. The ICAR, Indian Horticultural Research Institute and the Horticulture Commissioner were requested to confirm whether processable varieties for these identified products were available and if so what action was needed to promote cultivation of these varieties.
- ii. A coordinated approach needs to be adopted by DFPI, ICAR and Horticulture Commissioner for promoting cultivation of processing varieties. The Horticulture Commissioner and the ICAR have so far promoted only table varieties.
- iii. The cost of product development is very high. The infrastructure for product development needs to be supported by Government and a network of such product development centres established / the existing ones be strengthened.
- iv. A net work of analytical labs needs to be set up with the support of the Government for testing food products including chemical residues, pesticides and organic products.
- v. Backward linkages / contract farming is a matter of trust and relation between the processor and the farmer and can be successful as has been established by Pepsi experience. It was considered that any amendment of laws will not facilitate backward linkages / contract farming.

What is required is that the contract farming / backward linkages should be for the produce which is to be exclusively utilized for processing.

- vi. Value added centres need to be set up where pre-cooling, washing, grading, sorting, packaging facilities could be set up. These value-added centres can become a link between the wholesale market, processing unit and even for exports. Government will have to support the setting up of such centres.
- vii. The cost of processing equipment needs to be controlled. The imported machinery is not suitable for low volumes and hence not cost effective. CFTRI has developed standard processes which are not suitable for these imported machines. New processes need to be developed ,
- viii. In regard to cold chain, it transpired that the pre-coolers manufactured domestically are not suitable and the import duty on imported pre-coolers is 60% which makes it economically un-viable. Besides the benefits of pre-cooling also need to be made known to the farmers. The efficiency level of insulated vans is low which leads to 20% extra expenditure on energy. The duty levels on insulated vans and puff panels is also high. The question of duty reduction on entire cold chain and even the vehicles connected with cold chain, needs to be addressed.
- ix. Problems relating to banking were also highlighted. These relate to working capital which is based on annual sales and the requirement of making available export orders in advance or within one month and the availability of cash-credit being limited to 180 days only.
- x. It was felt that farming of organic products need to be promoted as there is a great demand for such products and these can fetch remunerative price. A coordinated approach needs to be decided by DFPI, APEDA, ICAR and Horticulture Commissioner.
- xi. To increase processing levels of processed food products, the need for reducing the excise duty and State taxes and levies was also pointed out. It was also suggested that duty structure on taxation on various food products from South Eastern countries such as Pakistan, Thailand, Malaysia should be collected for a comparative view.
- xii. The need for harmonizing the food laws including PFA and other laws which inhibit growth of processed food sector, transportation from one State to another etc., was also highlighted.

Besides the above, following was also decided :-

- i. A separate meeting will be held with the financial institutions to get their viewpoint on the problems faced by the processed food industry about the availability of finance/ working capital/ cash-credit limits.
- ii. A presentation will be made by M/s Snowman Foods Limited about the cold chain facilities being implemented by them.

The meeting ended with a vote of thanks to the chair.

POLICY CIRCULAR NO.38(RE-2000)/1997-2002 Dated : 22nd January, 2001

Attention is invited to Notification No. 44(RE-2000)/97-2002. Dated 24.11.2000.

Representations/references. Have been received from Trade and Customs regarding the scope and applicability of the provision of Standards of Weights and Measures (Package Commodity) Rules, 1977 on various imports.

In this regard, it is clarified that :

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RESEARCH ARTICLES

PHYSICO-CHEMICAL CHARACTERISTICS AND MICROBIOLOGICAL GROWTH IN RELATION TO PROCESSING TIME AND TEMPERATURE IN APPLE PULP VAR. *GOLDEN DELICIOUS*

Supriya Langthasa* and D. S. Khurdiya

Division of Fruit & Horticultural Technology

Indian Agricultural Research Institute

New Delhi - 110 012

ABSTRACT

Pulp extracted from *Golden Delicious* variety of apple subjected to heat processing at 70°C for 10, 20 and 30 minutes and at 90°C for 1, 5 and 10 minutes considerably reduced the enzymatic browning of pulp. TSS and pH of pulp increased marginally while acidity declined. Heat processing of pulp at 90°C for 5 minutes completely eliminated the presence of microorganisms.

INTRODUCTION

Apple is primarily used for table purpose. An insignificant proportion is used in the processing industries for the preparation of various products. It is important to process the pulp at particular temperature and time in order to maintain the physico-chemical characteristics at desired levels and for checking the microbial growth. The present experiment deals with the standardisation of processing time and temperature for apple in relation to physico-chemical characteristics at desired levels and for checking the microbial growth. The present experiment deals with the standardisation of processing time and temperature for apple

pulp in relation to physico-chemical characteristics and microbial population.

MATERIALS AND METHODS

Apple var. *Golden Delicious* was selected for the study. The apple pulp was subjected to heat treatment at two temperatures with different holding periods as given below:

Temperature Holding Periods

| | |
|------|-----------------------|
| 70°C | 10, 20 and 30 minutes |
| 90°C | 1, 5 and 10 minutes |

Fruits were cut into quarter, core removed and cooked under pressure in a pressure cooker by adding water at 10% to the weight of prepared fruit and passed through 16 mesh sieve. The pulp

thus obtained was divided into two lots. First lot was heated to 70°C with the holding time of 10, 20 and 30 minutes. The pulp was filled at that temperature in glass bottles of 200 ml capacity and sealed by crown corking and kept upside down and allowed to cool in air.

The second lot was heated in 90°C with the holding time of 1, 5 and 10 minutes. Pulp was filled at that temperature in glass bottles of 200ml capacity and sealed by crown corking and kept upside down and allowed to cool in air. The bottled apple pulp was stored in cool storage (7-10°C) for a week before chemical analysis. The apple pulp without any heat treatment was used

* Sr. Scientist, Horticultural Research Station, Azara, Guwahati - 78017, Assam

as control.

Heat processed pulp of *Golden Delicious* apple was analysed for TSS, acidity, pH, enzymatic browning and microbial count.

TSS was determined by hand refractometer. Acidity was estimated by the standard methods of AOAC (1975), pH by a pH meter and enzymatic browning as per method described by Ranganna (1994). Microbiological study was carried out by a series of dilution and spread plate method (Ranganna, 1994).

RESULTS AND DISCUSSION

The heat treatment influenced the physico-chemical characteristics of the pulp. TSS, acidity, pH and enzymatic browning showed either increasing or decreasing trend to heat treatment (Table 1).

Total Soluble Solids (TSS) : Heat treatment of pulp at 70°C and 90°C increased the TSS irrespective of holding times. But the increase in TSS was insignificant which could be attributed to the evaporation during processing. A similar opinion was put forth by Dar *et al.* (1992) in case of apple juice and Ghorai (1996) for kinnow mandarin juice.

Acidity : No specific trend was observed in the acidity level of the pulp processed at 70°C at different holding times. However, a slight decreasing trend of acidity of pulp processed at 90°C was observed but the difference was not significant. Similar findings were

reported earlier by Kim *et al.* (1993) in apple and Ghorai (1996) in heat processed kinnow mandarin juice.

pH : There was no significant change in pH of the pulp at both the processing temperatures.

Enzymatic browning : The enzymatic browning was greatly influenced by heat treatment. It showed a gradual decline with increase in processing time at both the temperatures. The beneficial result might be due to inhibition of polyphenol oxidase, the enzyme involved in browning. Dimick *et al.* (1951) viewed that the enzymatic browning could be inhibited by heat treatment. Later, the opinion was supported by works of Prabha and Patwardhan (1985), Kim *et al.* (1993) and Lozano *et al.* (1994) in apples.

Evaluation of Microbial population of apple pulp : It has been observed that the untreated apple pulp was highly contaminated with bacteria, yeast and moulds. When the pulp was processed at 70°C, the population of bacteria, yeasts and moulds were considerably reduced. But even at 30 minutes of holding time at 70°C, the population of bacteria was found to be 1×10^1 and yeast 1×10^2 cfu per g of pulp. Increase of processing temperature to 90°C with 5 minutes of holding time completely eliminated the microbiological population in the pulp. Hence, the processing of pulp at 90°C for 5 minutes of holding time could be considered as effective processing time and temperature to check the

microbial growth in the apple pulp. The result is well supported by Ghorai (1996) in kinnow mandarin juice (Table 2)

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Table 1 : Physico - chemical characteristics of apple pulp in relation to temperature and time of heat processing

| Treatments | TSS(%) | Acidity (%) | pH | Enzymatic browning (absorbance) |
|--------------------------|--------|-------------|------|---------------------------------|
| Untreated pulp (control) | 10.13 | 0.33 | 3.46 | 0.269 |
| Treated pulp | | | | |
| 70°C | | | | |
| 10 min | 10.17 | 0.31 | 3.50 | 0.256 |
| 20 min | 10.17 | 0.31 | 3.50 | 0.246 |
| 30 min | 10.20 | 0.29 | 3.50 | 0.220 |
| C.D. at 5% | NS | NS | NS | NS |
| 90°C | | | | |
| 1 min | 10.17 | 0.30 | 3.50 | 0.162 |
| 5 min | 10.23 | 0.28 | 3.50 | 0.105 |
| 10 min | 10.23 | 0.27 | 3.50 | 0.101 |
| C.D. at 5% | NS | NS | NS | 0.013 |

NS = Non-significant

Table 2 : Population of different micro-organisms in apple pulp in relation to temperature and time of heat processing

| Micro-organisms | Untreated pulp (control) | Processing treatments | | | | | |
|-----------------|--------------------------|-----------------------|---------------------|---------------------|---------------------|-------|--------|
| | | 70°C | | | 90°C | | |
| | | 10 min | 20 min | 30 min | 1 min | 5 min | 10 min |
| Bacteria | 12.4 x 10 ³ | 6 x 10 ² | 2 x 10 ² | 1 x 10 ² | 1 x 10 ² | - | - |
| Yeasts | 10.2 x 10 ³ | 4 x 10 ² | 1 x 10 ² | 1 x 10 ² | 1 x 10 ² | - | - |
| Moulds | 11.0 x 10 ³ | 2 x 10 ² | 1 x 10 ² | - | 1 x 10 ² | - | - |

Colony forming unit (cfu) of micro-organisms per g of pulp (average of 3 replications)

- sign denotes absence of micro-organisms.

EVALUATION OF SEVEN EXOTIC RED-FLESHED GUAVA VARIETIES FOR PROCESSING INTO RTS BEVERAGE

R. B. Tiwari and M. R. Dinesh
*Indian Institute of Horticultural Research,
 Hessaraghatta Lake Post, Bangalore 560 089*

ABSTRACT

Seven exotic red fleshed guava varieties including the local variety (Red-fleshed) were screened for making Ready-To-Serve (RTS) beverage. These varieties are characterised by their acidic taste and varying pulp colour from light pink to pinkish red. The range of values for various characteristic compositions of pulp were TSS 8.0 to 10.2°Brix, acidity 0.51 to 2.05%, reducing sugars 1.41 to 4.34% and ascorbic acid 146.8 to 200.00 mg/100g. Pulp yield was in the range of 72.1 to 84.8%. RTS beverage containing 15% pulp, 18°Brix TSS and 0.3% acidity was prepared. Based on the physico-chemical composition of pulp and RTS beverage, the guava variety '7-12 EC 147036' was found to be the best. The beverage samples were found acceptable after 6 months of storage at RT.

INTRODUCTION

Guava is one of the important fruits crops of India and most of the commercially produced fruits are used for fresh consumption. Guava fruits are valued for their characteristic flavour, fleshy texture as well as rich nutritional qualities. These fruits can be processed into several products such as jelly, beverage, nectar, jam, cheese, candies as well as canned pulp and slices. Among these, canned pulp, juice and nectar have great export potential. In Europe, there is a great demand for the pink and red-fleshed guava as these are used for preparation of tropical fruit mixes and nectar (Anonymous, 1999). Lycopene pigment is responsible for the pink or red-flesh colour in guava (Gross, 1987). It is reported that lycopene content in var. *Beaumont*

and *Red-fleshed* was 222 and 421 µg/100g respectively (Selvaraj, 1996). In addition to this, several other varietal characteristics are known to influence the quality of processed products and hence, suitability of different guava varieties for processing has been tested by several workers. Teatonia and Awasthi (1967) evaluated guava varieties for canning. Pulp quality of different guava varieties extracted by hot and cold methods have been studied by Harnanan et al. (1980) & Murari and Verma (1989). Varieties have also been evaluated for nectar (Murari and Verma, 1989) and RTS beverage (Pandey and Singh, 1999). Singh and Dhawan (1983) have recommended varieties with soft flesh, good colour and flavour for nectar and beverage production and *Lucknow - 49* was found best for jelly making.

In the present study, seven exotic varieties in the germplasm collection at Indian Institute of Horticultural Research were evaluated for RTS beverage making. These exotic varieties were highly acidic and unsuitable for fresh consumption. Since they possessed good flavour and different shades of pink colour, usefulness of these varieties for RTS beverage making was tested.

MATERIALS AND METHODS

Fully mature fruits of seven red-fleshed guava varieties viz., *Red-fleshed (local)*, *Red-fleshed (exotic)*, *Beaumont*, 7-39 EC 147034, 7-12 EC 147036, 9-35 EC 147036 and 'EC 147037' were used for the studies. Matured fruits were harvested, allowed to ripen for 2-3 days, washed, lye peeled in boiling solution of 3% NaOH and

pulped using mixer grinder. The sieved pulp was stored at -40°C temperature for further usage. After the initial standardisation of recipe, RTS beverage having 15% pulp, 18° Brix TSS and 0.3% acidity was prepared. The beverage was heat processed at 85°C and filled into sterilised bottles. These bottles were pasteurized at 95°C for 20 minutes, air cooled and stored at room temperature ($20-32^{\circ}\text{C}$).

Physico-chemical analysis of fresh pulp and RTS beverage was done initially as well as after 6 months of storage at RT ($20-32^{\circ}\text{C}$). Percentage of pulp, seed and unaccounted loss during pulp extraction were calculated in relation to total weight of fruit. TSS, acidity, ascorbic acid, sugars, pH, NEB were estimated by the methods described by Ranganna (1986). Viscosity of RTS beverage at 20°C was determined by using the Brookfield viscometer (Model LVTD) and the values were expressed in centipoise (cp). Sensory evaluation of RTS beverage was carried out by a panel of 10 judges, using Hedonic scale having scores for colour (30, consistency (30), and flavour (40). Data were statistically analysed for ANOVA using Randomised Block Design (RBD) with three replications and the treatment means were compared at a probability of 1 per cent (Snedecor and Cochran, 1967).

RESULTS AND DISCUSSION

Physico-chemical composition of pulp: Pulp colour largely decides the suitability of guava varieties for

beverages preparation as coloured ones are preferred over white ones. In the present study, pulp colour of *Red-fleshed (local)* was light pink while most of the exotic varieties had pink to pinkish red colour (Table 1). Pulp yield was maximum in variety '7-12 EC 147036' (84.8%). TSS of pulp ranged from 8.0 to 10.2°Brix , acidity 0.01 to 2.05%, reducing sugars 1.41 to 4.38%, non-reducing sugars 0.00 to 2.68% and total sugars 1.80 to 5.50% and ascorbic acid from 146.8 to 200.0 mg/100g, the highest being in variety '7-12 EC 147036'. High acidity in pulp is a desirable character as it provides better storage quality. Variation in acidity, colour (Teaotia et al. 1968) and ascorbic acid content of different varieties of guava pulp has also been reported (Harnanan et al. 1980, Singh and Dhawan, 1983; Murari and Verma, 1989; Pandey and Singh 1999).

Based on the physico-chemical data, it is presumed that the varieties in general possessed desirable traits for making different processed products especially RTS beverage.

Chemical composition and quality of RTS beverage : In order to select the most suitable variety among the evaluated ones, RTS beverages were prepared from different varieties. These samples were analysed for different characteristics. Initial analysis of RTS beverage indicated that ascorbic acid content varied from 12.7 to 30.1 mg/100 g, highest in '7-12 EC 147036'. The viscosity values ranged from 38.0 to 132.0

cps (Table 2). This is probably due to variation in the pulp particle size and dissolved polysaccharides as reported by Roy et al. (1977).

During storage, total sugar content of the beverage remained almost unchanged, but the reducing sugars increased significantly due to acid hydrolysis of sucrose. Further, upto 38.6% loss in ascorbic acid content was observed during the storage period of 6 months at RT. These results are in conformity with observation made by other workers (Murari and Verma 1989; Pandey and Singh, 1999)

Sensory quality of RTS beverage of guava : Significant differences were observed in the sensory quality scores of RTS beverages made from different guava varieties. The one from '7-12 EC 147036' recorded maximum score for colour (26.6), consistency (23.0) and flavour (30.6) which resulted in highest sensory score. This was significantly superior over other varieties used in the study (Table 2). Among the varieties evaluated, variety '7-12 EC 147036' was found to be the best for RTS beverage making. As the demand for coloured pulp and nectar of guava for export is increasing, this promising collection can be utilised by the processing industry. This variety can also be a potential / useful breeding material for development of new guava varieties for processing purposes.

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Table : 1. Physico-chemical composition of pulp of red fleshed guava varieties

| Variety/ Identity No. | Pulp colour | Pulp yield (%) | Seed (%) | Unaccounted losses (%) | T.S.S. (°)Brix | Acidity (%) | pH | Rducing Sugars (%) | Non.Red. Sugars (%) | Total Sugars (%) | Ascorbic acid (mg/100g) |
|-----------------------------|----------------|----------------------|-------------|------------------------------|-------------------|----------------|------|--------------------------|---------------------------|------------------------|-------------------------------|
| <i>Red-fleshed (L)</i> | Light pink | 72.1 | 8.4 | 19.5 | 10.2 | 0.54 | 3.15 | 4.19 | 1.31 | 5.50 | 191.5 |
| <i>Red-fleshed (E)</i> | Pink | 73.7 | 10.5 | 15.8 | 8.0 | 1.09 | 2.65 | 1.41 | 0.39 | 1.80 | 146.8 |
| <i>Beaumont</i> | Deep Pink | 74.4 | 10.4 | 15.2 | 10.0 | 0.51 | 3.29 | 1.56 | 2.68 | 4.24 | 163.4 |
| 7-39 EC 147034 | Light Pink | 76.7 | 10.2 | 13.1 | 9.0 | 1.14 | 2.60 | 4.38 | 0.35 | 4.73 | 180.9 |
| 7-12 EC 147036 | Pinkish red | 84.8 | 11.2 | 4.0 | 9.5 | 1.95 | 2.54 | 2.00 | 0.03 | 2.03 | 200.0 |
| 9-35 EC 147036 | Pink | 78.3 | 10.4 | 11.3 | 8.5 | 1.79 | 2.53 | 4.20 | 0.00 | 4.20 | 191.5 |
| EC 147037 | Light pink | 80.5 | 15.1 | 4.4 | 8.0 | 2.05 | 2.32 | 1.79 | 0.03 | 1.82 | 189.4 |
| Sem± | -- | 1.4 | 0.2 | 0.8 | 0.2 | 0.32 | 0.03 | 0.10 | 0.20 | 0.05 | 2.2 |
| CD at 1% | -- | 6.0 | 0.7 | 3.7 | 0.6 | 0.18 | 0.10 | 0.50 | 0.07 | 0.15 | 10.2 |

Table : 2. Chemical composition and sensory qualities of RTS beverage prepared from different red-fleshed guava varieties.

| Variety/ Identity No. | T.S.S. (°)Brix | Acidity (%) | pH | Reducing Sugars (%) | Non. Red. Sugars (%) | Total Sugars (%) | Ascorbic acid (mg/100g) | Viscosity (cps) | NEB OD at 440 nm) | Sensory quality score | | |
|-----------------------------|-------------------|----------------|------|---------------------------|----------------------------|------------------------|-------------------------------|--------------------|-------------------------|-----------------------|---------------------|-----------------------------|
| | | | | | | | | | | Colour (30) | Consistency (30) | Flavour Total (40) (100) |
| <i>Red-fleshed (L)</i> | 19.7 | 0.31 | 3.33 | 10.3 | 8.3 | 18.6 | 12.7 | 112.0 | 0.032 | 19.8 | 20.8 | 18.6 59.2 |
| <i>Red-fleshed (E)</i> | 19.9 | 0.29 | 3.39 | 7.1 | 11.7 | 18.8 | 23.7 | 107.5 | 0.013 | 22.8 | 21.2 | 24.6 68.6 |
| <i>Beaumont</i> | 19.9 | 0.30 | 3.38 | 9.2 | 9.7 | 18.9 | 22.8 | 38.0 | 0.022 | 18.2 | 21.4 | 25.6 65.2 |
| 7-39 EC 147034 | 19.8 | 0.35 | 3.31 | 12.5 | 6.5 | 19.0 | 27.0 | 51.2 | 0.032 | 21.4 | 21.8 | 24.4 67.6 |
| 7-12 EC 147036 | 19.3 | 0.29 | 3.36 | 6.3 | 12.4 | 18.7 | 30.1 | 95.2 | 0.036 | 26.6 | 23.0 | 30.6 80.2 |
| 7-35 EC 147036 | 20.0 | 0.32 | 3.38 | 6.9 | 11.4 | 18.3 | 27.2 | 132.0 | 0.044 | 21.2 | 21.0 | 23.2 65.4 |
| EC 147037 | 19.5 | 0.30 | 3.35 | 7.7 | 10.5 | 18.2 | 15.6 | 41.0 | 0.027 | 19.9 | 20.0 | 23.3 63.8 |
| Sem* | 0.2 | 0.02 | 0.10 | 0.2 | 0.1 | 0.1 | 0.8 | 3.2 | 0.001 | 0.3 | 0.2 | 0.4 0.9 |
| CD at 1% | N.S. | N.S. | N.S. | 1.0 | 0.4 | N.S. | 3.3 | 13.5 | 0.005 | 1.2 | 0.8 | 1.7 3.5 |

CLOUD STABILISING IN CITRUS JUICES

R. H. Patil and J. S. Pai

*Department of Chemical Technology**University of Mumbai, Matunga, Mumbai 400 019*

ABSTRACT

Newer methods for processing citrus fruits such as enzymic treatment, homogenisation, sonication, etc. are compared. These processes are tested to increase the yield of juice, for stabilising the cloudy juice and to prepare combinations of citrus juices which are more palatable. Enzyme processing gives higher yield but results in undesirable clarification. Sonication also gives higher yields but it reduces the transmittance giving better product. Mixing of orange and sweet lime juices gives better palatability which is further improved by sonication which also improves total solids, sugars, viscosity and yield. Cloud stabilisation and improvement in juice characteristics can be achieved by sonication. Juice characteristics also improved by homogenisation using APV Gaulin pressure homogeniser at 4000 psi. Sensory evaluation of mixed orange and sweet lime juices showed that homogenised mixed juices have very high acceptability

INTRODUCTION

The major citrus juices available on the world market are orange and grapefruit, which are cloudy and lemon and lime which are always clarified. In orange juice it is extremely important to preserve the cloud stability since most of the colour and flavour is associated with particulate material. Left to itself, orange juice will spontaneously clarify due to the action of pectin esterases (Lea, 1991). Some of the problems in the processing of citrus fruits are low recovery of juice due to high viscosity and fibrous structure which makes juice separation very difficult. When pectolytic enzymes are used to reduce the viscosity and to break down the structure for easy juice recovery, there is loss of cloudiness lowering the quality;

so this process is mainly used for citrus pulp wash recovery (Braddock & Kesterson, 1976). Among the pectolytic enzymes, pectinesterase deesterifies pectin. Subsequently, low methoxyl pectin or pectate coagulates with calcium ions from the juice causing cloud loss (Crandall *et al.*, 1983). Pectic acid can be hydrolysed to short chain fragments using pectinases under controlled conditions which can extend stability over short term as these fragments inhibit pectinesterase and also being too small to precipitate (Termote *et al.* 1977). Pectinases are commercially used for some of the other fruits such as apples (Faigh, 1995); however, with citrus fruits their application is variable. Therefore, pectinases are heat inactivated in orange juice pulp before the juice is separated (Wicker & Temelli, 1988). Sensory properties of citrus

juices such as flavour, colour, texture and aroma are closely or partly attributable to cloud (Klavons *et al.* 1994). The processing techniques such as homogenisation and sonication may increase the yield and improve the quality of juice by stabilising the cloud. The same has been investigated in this study.

MATERIALS AND METHODS

Bright orange fruits with juicy and sweet pulp as well as large, golden yellow, ripe sweet lime fruits were procured. These fruits were washed thoroughly with water to remove the dirt particles and extraneous matter, and soap solution to remove traces of pesticides. The washed and drained fruits were peeled and the citrus segments were then passed through electric screw type juice extractor. Care was taken not to crush the seeds.

Enzymes : Pectazyme P is a combination of pectate-transeliminase, polygalacturonase and pectinesterase viz. Enzyme in powder form with activity 100,000 units of pectinesterase and 500 units of polygalacturonase per g; Mashzyme with mainly pectic lyase, pectin-transeliminase, polygalacturonase and pectic methyl estic methyl esterase along with high cellulase and hemicellulase activity. It has about 90,000 units of pectinesterase, 50,000 units cellulase and 5,000 units amylase per g.

Enzyme treatment : The extracted juice was first heated to 93.6°C for 1 min to inactivate pectinesterase which is natively present in the citrus fruits and to avoid its interference with enzymes to be studied. The juice was cooled to room temperature (28°C). Enzymes were then added to the juice at a level of 0.05% and then kept for 3 hrs at room temperature (28°C) in a water bath. After the enzyme treatment, juice was heated to 93.6°C for 1 min for inactivation of the enzymes and they were filtered through bolting cloth. Enzymes used were Pectazyme P and Mashzyme.

Sonication of fruit juice : The extracted juice was first heated to 93.6°C for 1 min to inactivate pectinesterase which is natively present in the citrus fruits and to avoid its interference with enzymes to be studied. The juice was cooled to room temperature (28°C). The juice was then sonicated at room temperature (30°C) using Branson

Sonifier 450. The parameters were: Duty cycle 30%, output control 1 unit and time 20 min. Samples were drawn after every 2 min to check increase in total soluble solids. The proximate analysis of the fresh and sonicated juice were carried out after the juices were filtered through bolting cloth.

Citrus fruit beverage : A combination of orange and sweet lime was tried in different proportions. After getting the right proportion, the beverage tended to settle. Thus homogenisation was tried to overcome the settling using APV Gaulin - Laboratory, Homogeniser (LAB 60-10TBS). The extracted juices were mixed in right proportion, heated to 93.6°C for one min to avoid clarification of the juices by pectinesterases natively present. The juice was cooled to 29°C. The combined juice was then passed through homogeniser at varying pressures and tested for total soluble solids after centrifuging at 4000rpm at 29°C.

Analytical methods : Sugars were analysed by methods described by Ranganna (1986) and vitamin C was analysed by the method by Egan *et al.* (1981). Viscosity was determined by Ostwald viscometer and expressed as ratio of viscosity of juice to that of water. Transmittance was measured by Elico Spectrophotometer at 660 nm wavelength.

RESULTS AND DISCUSSION

Orange juice and sweet lime juice were treated with Pectazyme and

Mashzyme and juices were analysed for their chemical composition and other characteristics which are presented in Table 2. The properties of fresh juice are compared with those obtained after processing with enzymes.

There was very little change in the total solids after the treatment. However, there were increases in sugars indicating that there was hydrolysis of polysaccharides giving rise to higher sugar values both reducing and total. This is also reflected in similar increase in Brix values both reducing and total. This is also reflected in similar increases in Brix values. The result of hydrolysis has lowered viscosities markedly which has made possible the increases in yields. Both the enzymes have led to increases with Mashzyme increasing it more because it has cellulases which more effectively breaks down cellulose /pectin structures of the fibrous material which contains the juice sacs. There is however, the problem of increase in the clarity as shown by the transmittance. The juices were quite clear which are not preferred by the consumers whose clarity with lack of quality possibly equating it with dilution.

Similar trend is noticed in case of sweet lime juice. The enzyme treatments cause increase in sugars, lowering of viscosity giving higher yields but also higher clarity with the result of poorer quality juice.

Both orange and sweet lime juices were sonicated in Branson

Sonifier 450 for 18 min. Total solids of the juice were monitored and the results show that after 18 minutes there is no increase in total solids which were determined after centrifuging the juices to remove insoluble fibrous material which settled. So sonication to improve the cloud appearance was carried out for 18 minutes. Total solids increased to 10.73% in case of orange juice and 12.02% in case of sweet lime juice after sonication for 18min.

The sonicated juices were analysed and the comparative analysis is presented in Table 3 for both sweet lime and orange juices.

The results show that sonication has very little effect on sugar concentrations. There is a slight decrease in viscosity and a significant increase in the yield in both the juices. The most remarkable effect is on clarity. Both the juices showed substantial decrease in transmittance which is associated with increase in cloudiness. Sonication causes breakdown of fibrous particles and forms extremely small particles which are easily suspended without settling and without getting filtered out. There is very little change in the chemical structure; so other properties such as sugars do not change appreciably.

In order to correlate these findings with properties which consumers evaluate, these juices were analysed by sensory evaluation. The results are presented in Table 4. As can be seen there is deterioration of quality due to

enzymic treatments as seen by the lowering of scores for flavour, colour, cloudiness and appearance when compared with fresh orange and sweet lime juices. However, when sonication was carried out, there is an improvement of quality in all these respects. The scores are in fact better than those for the fresh juices. Thus, even though, there is less increase in the yield values with sonication compared with enzyme treatments, these juices were superior in sensory qualities.

Flavour in all enzyme treated samples is poorer. The turbidity or cloud of the citrus juices is due to a fine suspension of particulate matter. These particles range in size from about 0.4 to 5 μm (Klavons et al., 1994). Citrus juice flavour and colour are partly due to the cloud. When cloud particles are destabilised by partly solubilising and partly precipitating, the flavour and colour qualities are poorer. The colour of the juice became dull as result of the enzyme treatment due to clarity. The colours look brighter when slight opacity is associated with the juice. In the case of sonicated juice the opacity is further increased due to finely dispersed particles giving brighter colour. Cloudiness of the sonicated juice was better than fresh juice. Sonication disintegrates the particles and smaller particles are more stable because of greater surface area increasing the surface tension. The smaller particles also tend to scatter light which helps in improving the turbidity or cloud appearance.

Normally orange juice is more popular than sweet lime, the latter being associated with convalescing patients. However, mixed beverage of orange and sweet lime is becoming quite acceptable to all types of consumers; so various combinations were tested for them. The most acceptable combination was 50-50; so these juices were mixed in equal proportions and their stability tested. The mixture was not very stable as good amount of insoluble fibrous portion separated. This decreased the yield and gave juice of poorer appearance and cloudiness. Homogenisation was carried out to observe its effect on mixture.

The combined juice was subjected to different homogenisation pressures to increase the total solids in the filtered juice. Total solids of combined beverage at different homogenisation pressures and after centrifuging the juice at 2500 rpm for 10 min. was analysed for soluble solids. At 4000 psi, optimum soluble solids were produced; so this pressure was used for stabilisation.

Proximate analysis of the fresh and homogenised mixed juices was carried out and results are given in Table 3. As is seen, sugars and total solids increase after homogenisation. There is no change in pH and acidity. Viscosity increased substantially and so did yield. Sensory evaluation of the mixed juices, fresh and homogenised, was carried out and is reported in Table 4. When analysed by sensory

analysed by sensory evaluation almost all the parameters improved by homogenisation except flavour. As far as flavour is concerned, the homogenisation process increased temperature which might have lowered the flavour quality but all the other quality parameters significantly improved.

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Table 1. Physical characteristics of orange and sweet lime fruits

| Characteristics | Oranges | Sweet limes |
|---------------------|---------|-------------|
| Fruit weight | 132±11g | 162±15g |
| Equatorial diameter | 7±0.5cm | 7±0.5cm |
| Peels and seeds | 30g±6% | 24g±6% |
| Edible portion | 70g±4% | 76g±4% |
| Juice | 66g±8% | 55g±7% |
| Fibrous material | 34g±11% | 45g±10% |

Table 2. Effect of pectolytic enzymes on properties of orange and sweet lime juices

| Parameter | Orange juice | | | Sweet lime Juice | | |
|---------------------------|--------------|--------------------|--------------------|------------------|--------------------|--------------------|
| | Fresh juice | Juice ^a | Juice ^b | Fresh juice | Juice ^a | Juice ^b |
| Total solids (g/100ml) | 10.8 | 10.6 | 11.0 | 11.5 | 10.0 | 12.6 |
| Reducing sugars (g/100ml) | 5.1 | 5.23 | 5.43 | 5.75 | 5.8 | 7.0 |
| Total sugars (g/100ml) | 8.5 | 8.51 | 8.7 | 9.5 | 9.53 | 9.7 |
| Ascorbic acid (mg/100ml) | 67.5 | 47.0 | 60.0 | 31 | 26 | 25 |
| Total acidity, (%) | 0.37 | 0.36 | 0.38 | 0.23 | 0.28 | 0.21 |
| pH | 4.0 | 4.0 | 4.1 | 4.15 | 4.1 | 4.2 |
| °Brix | 9.2 | 9.4 | 9.8 | 9.6 | 9.7 | 10.3 |
| Relative viscosity | 2.4 | 1.8 | 1.4 | 2.65 | 1.6 | 1.4 |
| Transmittance (%) | 55.5 | 90.0 | 95.8 | 56 | 80 | 87 |
| Yield (%) [*] | 94.8 | 96.6 | 97.4 | 80 | 90 | 94 |

* Yield is the volume of juice recovered from the fruit pulp

^a Pectazyme treated, ^b Mashzyme treated

Table 3. Effect of sonication on orange (OJ) and sweet lime (SLJ) juices and homogenisation on mixed juices (MJ)

| Parameter | Fresh SLJ | Sonicated SLJ | Fresh OJ | Sonicated OJ | Fresh MJ | Homogenized MJ |
|---------------------------|-----------|---------------|----------|--------------|----------|----------------|
| Total solids (g/100ml) | 11.5 | 12.0 | 10.6 | 10.73 | 11.2 | 12.4 |
| Reducing sugars (g/100ml) | 5.9 | 5.9 | 5.0 | 5.55 | 4.9 | 5.1 |
| Total sugars (g/100ml) | 9.6 | 9.6 | 8.6 | 8.8 | 9.8 | 11.43 |
| Ascorbic acid (mg/100ml) | 30 | 25 | 70 | 50 | 87.5 | 73.5 |
| Total acidity, (%) | 0.21 | 0.21 | 0.38 | 0.44 | 0.64 | 0.64 |
| pH | 4.2 | 4.2 | 4.1 | 4.1 | 4.1 | 4.1 |
| °Brix | 9.8 | 10.1 | 11.0 | 9.7 | 11.0 | 12.0 |
| Relative viscosity | 2.7 | 2.33 | 2.4 | 1.93 | 2.55 | 4.73 |
| Transmittance (%) | 73.2 | 28.4 | 55.0 | 39.7 | - | - |
| Yield (%) [*] | 80 | 87 | 94.7 | 96.0 | 87.3 | 99.7 |

Table 4. Sensory evaluation of treated orange, sweet lime and mixed juices^{*}

| Characteristics | Orange juice | | | | Sweet lime juice | | | | Mixed juice | |
|-----------------|--------------|--------------------|--------------------|--------------------|------------------|--------------------|--------------------|--------------------|-------------|--------------------|
| | Fresh | Juice ^p | Juice ^M | Juice ^S | Fresh | Juice ^p | Juice ^M | Juice ^S | Fresh | Juice ^H |
| Flavour | 6 | 5 | 4 | 6 | 6 | 5 | 4 | 6 | 6 | 5 |
| Cloudiness | 5 | 4 | 4 | 6 | 6 | 4 | 3 | 7 | 5 | 7 |
| Colour | 6 | 4 | 3 | 7 | 6 | 5 | 5 | 7 | 6 | 8 |
| Appearance | 6 | 5 | 4 | 7 | 6 | 5 | 4 | 7 | 6 | 8 |
| Acceptability | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 6 | 8 |

^{*} Score out of 10

p -Pectazyme, M- Mashzyme, S- Sonicated, H- Homogenised

QUALITY OF *BAEL* FRUIT PULP POWDER - INFLUENCE OF CLONES AND DRYING METHODS

Ratna Rai and K. K. Misra

Department of Horticulture

G. B. P. U. A. & T., Pantnagar - 263 145

District Udham Singh Nagar (Uttaranchal)

INTRODUCTION

Bael is one of the most nutritious fruits, rich in vitamins and minerals and has medicinal value. It lacks popularity as a table fruit due to its hard shell, excessive mucilage and large number of seeds, but has great potential for processing. *Bael* fruit powder is prepared by some of the Pharmaceutical companies, but the information regarding the suitability of a clone with a suitable method of drying for the preparation of *Bael* fruit powder is lacking. Therefore, a comparison was made between sun and cabinet drying using various clones of *Bael* for preparation of pulp powder.

MATERIALS AND METHODS

The fruits of six clones of *Bael* viz., *Pant Bael 1*, *Pant Bael 2*, *Pant Bael 3*, *Pant Bael 7*, *Pant Bael 10* and *Pant Bael 11* were collected from the Horticultural Research Centre, Patharchatta of G.B.P.U.&T., Pantnagar for this study. The plants of each clone were planted at a distance of 5.0 metres apart in square system during the year 1987 and were maintained under uniform cultural practices. Three trees of uniform vigour and size were selected from each clone for

collection of fruit. The fruits were harvested at a uniform stage of maturity.

The fruit pulp was extracted from fully ripened fruits of each clone as per method of Roy and Singh (1979). The pulp was dried separately in the sun and cabinet drier ($60 \pm 1^\circ\text{C}$) in uniform size of trays. Thus, there were 12 treatments combinations (six clones x two methods of drying) replicated thrice in two factor Randomized Block Design. The dried pulp was ground and the powder was sieved through 30 mesh sieve to obtain uniform samples.

The yield of the powder was calculated as per method of Rasumussen (1967). Dehydration ratio was expressed as the ratio of the weight of the pulp to the weight of the dried powder. Moisture, crude fibre, crude protein, crude fat and total ash were estimated by standard methods (AOAC, 1984) while total carbohydrates and ascorbic acid were determined as per method of Ranganna (1986). Non-enzymatic browning (NEB) was measured as per method of Mehta and Tomar (1980). The data in per cent were angularly transformed

before statistical analysis. Both original and transformed values are presented in the tables.

RESULTS AND DISCUSSION

Influence Of Clones : The yield of fruit pulp powder in various clones was found in the range of 9.52 to 15.37 per cent (Table 1). *Pant Bael 7* gave significantly higher yield of powder, which was probably due to its higher edible portion, less moisture, fibre, seeds and skin contents. *Pant Bael 7* also gave lowest dehydration ratio. The differences in the dehydration ratio of the various clones might be attributed to the variation in the initial moisture content of their fresh pulp.

There was significant difference in proximate composition. The crude fibre was found in the range of 3.02 to 7.92 per cent while total ash, total carbohydrates, crude protein and crude fat were found in ranges of 4.31-5.83 per cent, 76.97-83.51 per cent, 4.0-5.96 per cent and 0.38-0.8 per cent, respectively. This difference in proximate composition might be due to the variation in the genetic constitution of different clones. The ascorbic acid retention

in the pulp powder of various clones was found in the range of 52-72 per cent, the highest being in *Pant Bael 7*. The Non Engymatic Browning was found in the range of 10.24-16.03 nm, the least being in the pulp powder of *Pant Bael 7*. The differences in NEB of pulp powder of different clones might be due to the variation in the phenolic compounds of the pulp of various clones.

Influence of drying methods : The effect of methods of drying on yield and dehydration ratio of the pulp powder was not significant (Table 1). However, there was significant effect on the proximate composition of the powder. The crude fibre, crude protein and total ash were higher in sun drying while crude fat and carbohydrate contents were higher in cabinet drying. The lower fibre content in cabinet drying might be due to the destruction of some of the fibre at higher temperature in cabinet drying while lower protein content in cabinet drying, might be due to the enhanced Maillard reaction causing destruction of some of the proteins (Finot, 1990). The higher ash content in sun drying was probably due to the addition of impurities from the outside atmosphere in open condition.

The methods of drying significantly affected the ascorbic acid content of the pulp powder. The loss of ascorbic acid was more in sundrying than in cabinet drying. The ascorbic acid was probably lost at a faster rate during slow and

long drying process in the sun as compared to cabinet drying. The methods of drying significantly affected the NEB. There was more NEB during sundrying as compared to cabinet drying which might be due to the oxidation reactions during long exposure to sunlight.

Influence of interaction : The interaction between clones and methods of drying (Table 2) had no significant effect on the yield, dehydration ratio, crude fibre, total ash and crude fat contents of the fresh pulp powder but there was significant effect of interaction on crude protein and total carbohydrates of the fresh pulp powder. The cabinet dried powder of *Pant Bael 3* had higher carbohydrate and ascorbic acid contents. The sun dried powder of *Pant Bael 7* had significantly higher crude protein while the cabinet dried powder of *Pant Bael 7* gave significantly lower NEB.

Influence of storage : Clones as well as drying methods had no significant effect on moisture content of fruit pulp powder during storage but their interaction was found to be significant (Table 3 and 4). The cabinet dried fruit pulp powder of *Pant Bael 3* showed significantly lower moisture content.

The clones and the drying methods significantly affected the ascorbic acid content of the stored fruit pulp powder but their interaction was found to be non-significant (Table 3 and 4). The highest ascorbic acid was found in fruit pulp powder of *Pant Bael 3*.

The cabinet dried samples had higher ascorbic acid content than sun dried samples. The clones, methods of drying and their interaction had significant effect on NEB of the pulp powder. *Pant Bael 7*, cabinet drying and their interaction gave lower NEB after 4 months of storage (Table 4).

CONCLUSION

A significant variation of quality of *Bael* fruit pulp powder was found among the clones and methods of drying. Clone, *Pant Bael 7* under cabinet drying was found better for preparation of fruit pulp powder.

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Table: 1. Influence of clones and drying methods on the yield, dehydration ratio and proximate composition of *Bael* pulp powder.

| Treatments | Yield (%) | Dehydration ratio | Proximate composition | | | | |
|---------------------|------------------|-------------------|-----------------------|-----------------|-------------------------|-----------------|----------------|
| | | | Crude fibre (%) | Total ash (%) | Total Carbohydrates (%) | Crude protein | Crude fat (%) |
| Clones | | | | | | | |
| <i>Pant Bael 1</i> | 10.68 (19.08) | 6.30 | 4.09 (11.67) | 5.83 (13.97) | 79.82 (63.30) | 5.48 (13.54) | 0.55 (4.26) |
| <i>Pant Bael 2</i> | 10.89 (19.26) | 6.23 | 7.92 (16.34) | 4.92 (12.81) | 76.97 (61.33) | 5.09 (13.04) | 0.80 (5.12) |
| <i>Pant Bael 3</i> | 10.57 (18.97) | 6.72 | 3.02 (10.01) | 4.60 (12.39) | 83.51 (66.05) | 4.00 (11.53) | 0.49 (4.02) |
| <i>Pant Bael 7</i> | 15.37 (23.08) | 5.22 | 5.12 (13.08) | 5.29 (13.29) | 78.98 (62.72) | 5.99 (14.13) | 0.86 (5.31) |
| <i>Pant Bael 10</i> | 9.52 (17.97) | 7.43 | 6.44 (14.70) | 5.59 (13.68) | 77.25 (61.51) | 5.66 (13.76) | 0.58 (3.51) |
| <i>Pant Bael 11</i> | 10.67 (19.06) | 7.52 | 5.79 (13.92) | 4.31 (11.98) | 79.79 (63.29) | 5.17 (13.13) | 0.42 (3.69) |
| S.E.M.± | (0.020) | (0.203) | (0.017) | (0.016) | (0.024) | (0.022) | (0.025) |
| C.D. at 5% | (0.059) | (0.596) | (0.052) | (0.048) | (0.071) | (0.064) | (0.074) |
| Drying methods | | | | | | | |
| Cabinet drying | 11.26 (19.55) | 6.50 | 5.34 (13.22) | 5.01 (12.92) | 79.77 (63.31) | 5.08 (13.00) | 0.62 (4.46) |
| Sun drying | 11.36 (11.30) | 6.64 | 5.45 (13.36) | 5.17 (13.12) | 79.00 (62.76) | 5.37 (13.38) | 0.55 (4.17) |
| S.E.M. ± | (0.011) | (0.12) | (0.010) | (0.009) | (0.014) | (0.013) | (0.014) |
| C.D. at 5% | NS | NS | (0.030) | (0.027) | (0.041) | (0.037) | (0.043) |

*Figures in parentheses indicate transformed values.

Table 2: Influence of interaction (clones x drying methods) on proximate composition of *Bael* fruit powder.

| Clones | Carbohydrate (%) | | Crude protein (%) | |
|---------------------|------------------|------------------|-------------------|-----------------|
| | Cabinet drying | Sun drying | Cabinet drying | Sun Drying |
| <i>Pant Bael 1</i> | 80.21 (63.59) | 79.43 (63.03) | 5.28 (13.28) | 5.68 (13.79) |
| <i>Pant Bael 2</i> | 77.38 (61.60) | 76.57 (61.05) | 4.96 (12.86) | 5.23 (13.22) |
| <i>Pant Bael 3</i> | 83.90 (66.34) | 83.13 (65.75) | 3.85 (11.31) | 4.15 (11.75) |
| <i>Pant Bael 7</i> | 79.42 (63.75) | 78.56 (62.41) | 5.88 (14.04) | 6.04 (14.22) |
| <i>Pant Bael 10</i> | 77.60 (63.54) | 76.91 (61.28) | 5.46 (13.52) | 5.85 (14.00) |
| <i>Pant Bael 11</i> | 80.15 (66.31) | 79.44 (63.03) | 5.05 (12.98) | 5.28 (13.29) |
| S.E.m.± | (0.034) | | (0.031) | |
| C.D. at 5% | (0.100) | | (0.091) | |

* Figures in parenthesis indicate transformed values.

Table 3: Influence of clones and drying methods on the quality of *Bael* fruit powder after storage period.

| Treatments | Moisture (%) | | Ascorbic acid (mg/100g) | | NEB (O.D. at 420nm) | |
|-----------------------|-----------------|-----------------|----------------------------|-------|------------------------|-------|
| | 1 | 2 | 1 | 2 | 1 | 2 |
| | | | | | | |
| <i>Pant Bael 1</i> | 4.22 (11.82) | 4.96 | 33.17 | 14.45 | 13.76 | 17.79 |
| <i>Pant Bael 2</i> | 4.32 (11.99) | 5.24 | 24.58 | 18.54 | 12.06 | 15.93 |
| <i>Pant Bael 3</i> | 4.37 (12.07) | 5.04 | 43.54 | 19.73 | 15.64 | 18.10 |
| <i>Pant Bael 7</i> | 4.09 (11.67) | 5.80 | 32.49 | 16.88 | 10.24 | 12.33 |
| <i>Pant Bael 10</i> | 4.38 (12.08) | 5.15 | 22.26 | 13.55 | 16.03 | 18.43 |
| <i>Pant Bael 11</i> | 4.53 (12.29) | 5.36 | 16.39 | 7.92 | 13.28 | 15.59 |
| S.E.m.± | (0.013) | (0.024) | 0.100 | 2.04 | 0.017 | 0.017 |
| C.D. at 5% | (0.038) | NS | 0.300 | 6.00 | 0.050 | 0.050 |
| Drying Methods | | | | | | |
| Cabinet drying | 4.25 (11.89) | 5.23 (13.18) | 33.73 | 17.47 | 12.50 | 14.43 |
| Sun Drying | 4.39 (12.09) | 5.29 (13.29) | 23.75 | 12.88 | 14.50 | 18.29 |
| S.E.m.± | (0.008) | 0.14 | 0.057 | 1.18 | 0.010 | 0.010 |
| C.D. at 5% | (0.022) | NS | 0.170 | 3.46 | 0.028 | 0.030 |

* Figures in parentheses indicate transformed values

1 : Before storage, 2 : After storage

Table : 4 Influence of interaction (clones x drying methods) on the quality of *Bael* fruit powder after storage period.

| Clones | Moisture (%) | | | | Ascorbic acid (mg/100g) | | NEB (O.D. at 420 nm) | | | |
|---------------------|-----------------|-----------------|-----------------|-----------------|----------------------------|----------------|----------------------|----------------|----------------|----------------|
| | Before storage | | After storage | | Before storage | | Before storage | | After storage | |
| | M ₁ | M ₂ | M ₁ | M ₂ | M ₁ | M ₂ | M ₁ | M ₂ | M ₁ | M ₂ |
| <i>Pant Bael 1</i> | 4.16 (11.76) | 4.28 (11.93) | 4.84 (12.71) | 5.08 (13.02) | 39.62 | 26.72 | 12.97 | 14.55 | 16.23 | 19.35 |
| <i>Pant Bael 2</i> | 4.22 (11.85) | 4.42 (12.13) | 4.95 (12.85) | 5.53 (13.60) | 28.76 | 20.41 | 10.91 | 13.20 | 13.33 | 18.52 |
| <i>Pant Bael 3</i> | 4.29 (11.95) | 4.45 (12.18) | 4.75 (12.58) | 5.33 (13.35) | 50.77 | 36.30 | 14.34 | 16.93 | 16.30 | 19.87 |
| <i>Pant Bael 7</i> | 4.04 (11.60) | 4.14 (11.73) | 6.66 (14.87) | 4.94 (12.84) | 35.84 | 29.14 | 9.44 | 11.04 | 10.60 | 14.07 |
| <i>Pant Bael 10</i> | 4.31 (11.47) | 4.45 (12.18) | 5.05 (12.98) | 5.25 (13.25) | 27.19 | 17.32 | 14.77 | 17.28 | 16.02 | 20.87 |
| <i>Pant Bael 11</i> | 4.46 (12.19) | 4.60 (12.39) | 5.12 (13.08) | 5.59 (13.67) | 20.21 | 12.58 | 12.57 | 14.00 | 14.11 | 17.08 |
| S.E.M.± | 0.018 | | 0.34 | | 0.14 | | 0.023 | | 0.024 | |
| C.D. at 5% | 0.054 | | 1.00 | | 0.41 | | 0.070 | | 0.071 | |

* Figures in parentheses indicate transformed values

M1 : Cabinet drying, M2: Sun drying

PROMOTIONAL STRATEGIES FOR PROCESSING & MARKETING OF FRESH PRODUCE OF NORTH EASTERN REGION OF INDIA IN THE PRESENT GLOBAL SCENARIO

S. Bhattacharjee

Executive Director

Neramac Ltd., Guwahati - 781005

ABSTRACT

The paper critically evaluates the present state and problems of processing industry in North-Eastern Region, proposing suitable promotional strategies.

INTRODUCTION

India is one of the world's largest agricultural and horticultural producing nation. The country's horticultural sector has registered a higher growth in overall terms during the post reform period with the total production having increased from 96.11 million tonnes in 1991-92 to 141.05 million tonnes in 1996-97.

Fruits and processed fruit products are an important part of the global trade and these represent an important foreign exchange earner for agriculture based economies. The Indian share in the global fruit export market is around 14-16% while its share in the export of processed fruit is less than 1% when compared to the global market of US \$10 billion.

In the fresh fruit segment, the main fruits exported from India are mango, banana, grapes, citrus, guava, apple, litchi, pineapple and papaya. The total horticultural exports during 1995-96 was

105.687MT, contributing almost 20-21% of the total agricultural export earning of the nation. Of these, the main fruits being cultivated in the North Eastern Region are Pineapple, Citrus, Guava, Banana, Sapota, Litchi and Apple.

The estimated world consumption of cut flowers and pot plants is of the value of US\$50 billion, with international trade worth over US\$6 billion with an annual growth rate of 10%. The total value of export of floriculture products from India rose from Rs.28 crores in 1993-94 to Rs. 58 crores in 1995-96.

The total size of herbal medicine industry in India is in the range of Rs.11 crores with an impressive annual growth of 26%. The world trade is over US\$60 billion with a growth of 7%.

NORTH EASTERN REGION - Present Status

The North East is bottled up in a corner of India with only two

percent of its external perimeter matching with the rest of the country. The region comprises of the Seven States, viz, Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland & Tripura bounded by Bangladesh, Myanmar and China and accounts for 7-8% of the total land space of the country. Recently Sikkim has also been included in the North Eastern Region.

The region is divided into discreet plains regions encompassed within hills, with number of agro-climatic zones within them. The region is bountifully endowed with bio-diversity, hydro potential, oil and gas, coal, limestone & forest wealth. It is ideally suited to produce a whole range of plantation crops, spices, fruits & vegetables, flowers & herbs, much of which could be processed and exported to the rest of the country & world-wide.

A. HORTICULTURE

North Eastern Region has many

horticulture crops to offer. The total production of fruits in the region is around 21.12 lakhs tonnes, which is 5.5% of the total production in the country while the production of vegetables is around 33.87 lakhs tonnes contributing 5% of the total production of the country.

The current status of fruits & vegetables in the various states of the region is given in Table-I and Table-II while Table-III gives the scenario of spices grown in the region.

The main fruits of the region are banana, citrus fruits (including oranges) and pineapple. Banana accounts for 25% of the area under horticulture crops, while citrus & pineapple have a share of 21% and 19% respectively. The other fruits cultivated in the region are jackfruit, apple, litchi, guava, papaya, mango, plum and peach.

Some rare fruits like *hatkola* and passion fruit having good export potential are cultivated in the states of Mizoram and Nagaland. They have a good demand in the European countries. Different vegetables grown in the region are; potato, cabbage, brinjal, tomato etc.

In spices ginger, turmeric, chillies and large cardamom constitute major shares. Table-IV represents the comparative productivity of different fruits, vegetables and spices grown in North Eastern Region with that of All India.

B. FLORICULTURE

Floriculture has become a major thrust sector in India's exports. The existing floriculture products of the North Eastern States are mainly begonia, chrysanthemum, chineraria, dahlia, aster, gladiolis, roses, lilies and carnations.

C. ORCHIDS

The entire region is a rich storehouse of orchids and about 700 species of orchids have been identified in the North East. Most of the orchids grown in the region are wild. With improvement of infrastructure, orchid cultivation & floriculture can become high export earner for the region.

D. MEDICINAL PLANTS

North East has a vast reserve of medicinal plants. Companies like Dabur, Zandu, Indian Herbs, Arya Vaidyashala, Kottakkal are sourcing many medicinal plants from the region.

E. AROMATIC PLANTS

Of the aromatic plants, citronella and tung have potential to be cultivated as import substitute. Agar has good potential for export. Lemon grass is also grown in North Eastern Region. Production of citronella is more than 150 MT in the region, concentrated near upper Assam, North Cachar Hills of Assam, Dimapur in Nagaland & Pasighat in Arunachal Pradesh. They are widely used for perfumery & cosmetics Industry.

The common problems of some important horticultural crops in North Eastern Region are as under :-

1) Old plantation, low yields affected by virus and infestation by nematodes leading to unstable production, non-uniformity in size, poor quality and shelf life, are common in oranges, litchi and pineapple.

2) Lack of scientific cultivation and post harvest handling facilities are common problems in varieties of ginger, *lakadong* variety of turmeric and chillies, which have high export potential.

F. FRUIT PROCESSING UNITS

Fruit processing has tremendous scope in the North Eastern Region. The technology of processing although introduced long back, not much headway could be made in this sector. This sector employs hardly 1,200 persons at plant & marketing levels with a meagre turnover of approx. Rs. 2 crore in the region. Table-V presents the state-wise processing plant capacities. The current status reveals that most of these units have become unprofitable ventures, many have been forced to shut down, while others are only intermittently operational. The average capacity utilization of such units vary from 10-35%. The combined market share of the locally processed products is estimated to be less than 15%. The contribution of the fruit processing units to the horticulture economy of the region

has been negligible.

The common problems identified in most of the processing units located in the region are :

- Absence of stable linkage between the growers & the processing units and markets.
- Inadequate working capital for procurement of raw materials & packing materials.
- High cost of packaging & transportation.
- Non-availability of packaging materials in smaller units.
- Inadequate quality control facilities.
- Lack of organized marketing & post harvest management.
- Poor sales & marketing performance.

PROMOTIONAL STRATEGIES

Global markets are highly quality conscious. To keep pace with this and also based on the existing scenario discussed in this paper, the strategies should be to adopt a concerted effort beneficial to all involved, for increasing the productivity of the potential horticultural crops with good marketing facilities through integrated development of horticulture.

STRATEGY 1

To overcome the problems of the potential horticulture crops of the region actions are required on the following :-

Staggering harvest is to be introduced to avoid seasonal glut. Import of improved planting materials and its subsequent tissue-culture will bring good result in pineapple.

Rejuvenation of the existing orchards and introduction of modern methods of cultivation with use of tissue culture technique for mass propagation of disease-free planting material for citrus oranges & litchis.

Introduction of inter/mixed cropping and use of short duration high yielding varieties, specially of *cavendish* groups of bananas. Massive plantation is to be undertaken for cashew nut. It can be grown as shade plant or intercrop.

STRATEGY-II

To facilitate development of marketing of fresh produces in the region, the following needs attention :-

- Introduction of refrigerated vans to transport fruits from North Eastern region to other parts to avoid transportation losses and maintain quality.
- Setting up of centralized cold storage of higher capacities at Guwahati, the gateway of the region.
- Expansion of the existing internal container depot to handle refrigerated cargo from Guwahati.
- Export of special fruits like

passion fruit & Carrambola along with the large number of floricultural products & ornamental plants from North Eastern Region can be encouraged by strengthening the perishable cargo handling & storage facilities at the Airports.

- The Lokpriya Gopinath Bordoloi Airport at Borjhar already earmarked to become an International Airport should be able to handle and in-transit store various perishable commodities in case of delay in lifting.
- The airports at Aizawl, Silchar, Jorhat, Imphal & Dimapur should be equipped with walk-in-type cold storages as set up in Guwahati & Agartala to store perishable items.

STRATEGY III

The strategy for the development of processing industries in the region can be taken up by a large centrally controlled organization with all the in-house infrastructure and sound financial position, in order to cater to a few short & long term objectives :-

- The short-term objectives like establishing a common consumer brand, establishing a quality analysis & monitoring system, providing sufficient stocks of packaging materials like can, bottle, etc. along with a transportation system to

collect the produce from each unit & store in a centralized location prior to dispatch and providing retail outlets at regional, institutional as well as at national levels.

- The long-term objectives can be like organizing supply of raw materials & consumables to processing units & buy-back of products, developing franchise units for processing of fruits and vegetables, development of market for other products such as floriculture/ orchids and medicinal plants, developing contract farming and international markets.

STRATEGY IV

Setting up of a quality analysis & testing laboratory for physical, chemical & microbiological analysis

of all types of food products, specially raw and processed fruits & vegetables, spices, condiments etc. The Analysis and Quality Control Laboratory would assist in improving the quality of these products to be able to compete in national and international markets. The FPO unit set up at Guwahati should be strengthened to act as a licensing organization.

STRATEGY V

Development of infrastructure and storage facilities at Border Points to trade with neighbouring Countries.

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Table-1 Area and production of fruits in the North Eastern Region

| STATE | 1994-95 | | 1995-96 | |
|-----------|---------|------------|---------|------------|
| | AREA | PRODUCTION | AREA | PRODUCTION |
| ASSAM | 100.7 | 12.3 | 101.1 | 12.1 |
| ARUNACHAL | 24.6 | 0.5 | 27.3 | 0.6 |
| MANIPUR | 22.5 | 1.1 | 22.6 | 1.1 |
| MEGHALAYA | 23.8 | 2.0 | 24.8 | 2.3 |
| MIZORAM | 11.6 | 0.5 | 15.2 | 0.7 |
| NAGALAND | 4.8 | 0.7 | 4.8 | 0.7 |
| TRIPURA | 46.8 | 3.2 | 32.2 | 4.0 |
| SIKKIM | 9.0 | 0.1 | 9.2 | 0.1 |
| TOTAL | 244.1 | 20.5 | 237.5 | 21.1 |
| ALL INDIA | 4309.6 | 386.0 | 3357.2 | 415.0 |

Source : National Horticulture Board-Indian Horticulture Database-1998.

Table II : Area and production of vegetables in the North Eastern Region

Area : In '000ha.
Production : In Lakh.MT.

| STATE | 1994-95 | | 1995-96 | |
|-----------|---------|------------|---------|------------|
| | AREA | PRODUCTION | AREA | PRODUCTION |
| ASSAM | 188.3 | 19.7 | 249.1 | 24.8 |
| ARUNACHAL | 17.2 | 0.8 | 17.2 | 0.8 |
| MANIPUR | 4.6 | 0.3 | 4.8 | 0.3 |
| MEGHALAYA | 25.4 | 1.9 | 22.2 | 2.1 |
| MIZORAM | 11.8 | 0.7 | 12.4 | 0.7 |
| NAGALAND | 8.1 | 0.7 | 4.8 | 0.7 |
| TRIPURA | 31.9 | 3.2 | 32.0 | 3.5 |
| SIKKIM | 8.6 | 0.2 | 8.7 | 0.5 |
| TOTAL | 296.3 | 27.9 | 354.6 | 33.8 |
| ALL INDIA | 5012.9 | 672.8 | 5335.4 | 715.9 |

Source : National Horticulture Board-Indian Horticulture Database-1998

Table - III Area and production of spices in the North Eastern Region

Area : In '000
Production : In Lakh. MT.

| STATE | 1994-95 | | 1995-96 | |
|-----------|---------|------------|---------|------------|
| | AREA | PRODUCTION | AREA | PRODUCTION |
| ASSAM | 40.6 | 1.13 | 41.4 | 1.14 |
| ARUNACHAL | 4.0 | 0.19 | 4.2 | 0.20 |
| MANIPUR | 6.8 | 0.04 | 6.8 | 0.04 |
| MEGHALAYA | 10.0 | 0.46 | 10.0 | 0.47 |
| MIZORAM | 4.3 | 0.13 | 3.8 | 0.18 |
| NAGALAND | 0.8 | 0.08 | 0.8 | 0.09 |
| TRIPURA | 3.9 | 0.05 | 3.9 | 0.05 |
| SIKKIM | 4.0 | 0.03 | 4.7 | 0.04 |
| TOTAL | 79.0 | 2.14 | 75.8 | 2.24 |
| ALL INDIA | 1166.3 | 16.36 | 1196.6 | 14.11 |

Source : Director of Economics & Statistics

Table IV Productivity of fruits, vegetables & spices (North East & India)

| | FRUITS | | VEGETABLES | | SPICES | |
|---------|-----------|------------|------------|------------|-----------|------------|
| | (Kg/HA) | (Kg/HA) | (Kg/HA) | | (Kg/HA) | |
| | All India | North East | All India | North East | All India | North East |
| 1994-95 | 8957 | 8399 | 13429 | 9440 | 1403 | 2715 |
| 1995-96 | 12363 | 8894 | 13410 | 9550 | 1180 | 2959 |

Source : National Horticulture Board-Indian Horticulture Database 1998.

Table-V : Processing plant capacities in the North Eastern States
(Installed capacity : MT)

| STATE | INSTALLED CAPACITY | GOVT. UNITS | | PVT. UNITS | | TOTAL UNITS | |
|----------------------|-----------------------|-------------|------|------------|------|-------------|------|
| | | NOS. | CAP. | NOS. | CAP. | NOS. | CAP. |
| ARUNACHAL PRADESH | 200 | 1 | 150 | 1 | 50 | 2 | 200 |
| ASSAM | 650 | 4 | 350 | 7 | 300 | 11 | 650 |
| MANIPUR | 900 | 2 | 340 | 7 | 560 | 9 | 900 |
| MEGHALAYA | 1000 | 2 | 100 | 1 | 900 | 3 | 1000 |
| MIZORAM | 200 | 5 | 200 | - | - | 5 | 200 |
| NAGALAND | 1500 | - | - | 2 | 1500 | 2 | 1500 |
| TRIPURA | 2660 | 4 | 256 | 2 | 100 | 6 | 2660 |
| TOTAL N.E. | 7110 | 18 | 3700 | 20 | 3410 | 38 | 7110 |

Source : APEDA Report 1997

REVIEW ARTICLE

EVAPORATIVE COOLING SYSTEMS FOR STORAGE OF FRUITS AND VEGETABLES

Sanjaya K. Dash and Pitam Chandra

Division of Agricultural Engineering

Indian Agricultural Research Institute

New Delhi - 110 012

ABSTRACT

Evaporative cooling principle has been used extensively for creating favourable atmosphere in an enclosure for storage of horticultural produce. Evaporatively cooled (EC) storage structures, due to their low initial investment and almost no energy requirement, have become popular for short term storage of horticultural produce in many places of the country. The paper presents a brief account of studies on different types of EC structures for storage of fruits and vegetables. The review indicates that there is ample scope for a detailed study on the design of EC structures and subsequent improvement.

INTRODUCTION

Refrigerated storage, which is the best method for storing fruits and vegetables in their fresh form, is not only energy intensive but also involves huge capital investment. Besides, it is not practicable for rural or on-farm storage, where the producer would like to store the commodities for only a few days to accumulate sufficient quantity of produce before taking them to markets, which are usually far off and situated in urban areas. Power availability and its cost are also major constraints, which prohibit the refrigerated storages to be recommended for on-farm short duration storage^{8,33}. Hence, there is

a shift in emphasis from cold storage to other alternative storage systems. A low cost option to maintain lower temperature in an enclosed chamber has been a matter of prime importance. Evaporatively cooled storage is one such alternative system that is being explored in the country³³.

Some studies have been carried out on storage of fruits and vegetables, based on the principle of evaporative cooling, but these are still at early stages of research and development. It is imperative to accelerate this technology development, to make it commercially viable¹⁸. Maini and Anand²³ have described the

importance of low temperature storage for post harvest management of horticultural produce and have stressed for establishing EC systems for short time storage of perishables at farm level, for precooling before transit and storage and also improving its use during transit. In this paper, an effort has been made to collect the information available on different developments on evaporative cooling systems in the country and abroad for storage of fresh horticultural produce with a view to identifying constraints.

EVAPORATIVE COOLING PRINCIPLE AND METHODS

Evaporative cooling is also known as the adiabatic saturation of

air. It is a thermodynamic process, where a part or all of the sensible heat of moist air is converted to latent heat, thereby producing a reduction in temperature. Evaporation of water produces a considerable cooling effect, and more the amount of evaporation, greater is the cooling effect¹⁰. Thompson and Kasmire⁴⁹ observed that the COP of an evaporative cooler was about 14 and it used about 80% less energy than an equivalent sized mechanical refrigeration system with a COP of 3. Theoretically the lowest temperature that can be achieved by evaporation of water is the wet bulb temperature of the moist air¹⁴. So higher the temperature and lower the relative humidity of the ambient air, more is the adiabatic cooling effect. Hence, in tropical areas where the temperature is very high and the RH of the environment is low during most parts of the year, evaporative cooling could be economically utilised for enhancing the shelf life of fresh commodities³. The system produces cool, high humidity air that can be forced past the produce, even after it has cooled, without damaging it.

Evaporative cooling is one of the earliest methods evolved by man for comfort cooling of residential buildings^{7,28}. This principle has been tried extensively for creating a modified atmosphere in an enclosure, favourable for crop growing, livestock housing or storage of horticultural produce^{2,3,7,36,44,51}. The most common evaporative cooling system uses a wetted pad through which air is passed at a uniform rate to make it

saturated^{22,28,45,57}. Evaporative cooling by on-surface evaporation or by using a misting/fogging equipment or spray cooling have also been practised in animal houses or greenhouses used for crop production^{5,16,21,44}. Efficient evaporative coolers are capable of maintaining the temperature inside the enclosure within 2°C of the ambient wet bulb temperature⁵⁷. These temperatures are acceptable for cooling the chilling sensitive vegetable crops listed in Table 1 (Thompson and Kasmire⁴⁹). Vegetable crops not listed in the table and most fruits, with the exception of citrus, avocado and other tropical species require a storage temperature near 0°C and would not be suitable for this system⁴⁹. Initial investment and the maintenance cost for such a system are appreciably low^{7,49}. The temperatures obtainable by single storage evaporative cooling, as reported by Hall⁴ is presented in Table 2.

EVAPORATIVE COOLERS FOR STORAGE OF FRUITS AND VEGETABLES

Cold storage, besides having other limitations is capital intensive and therefore cannot be expanded rapidly to meet the needs of the farmers. Hence a farm level storage system, which is less capital intensive and which extends the shelf life of fruits and vegetables sufficiently to realise better prices is very much needed. In this context, EC storage is considered to meet the much desired need and hence work had been initiated in the early eighties at

CFTRI, Mysore; CPRI, Shimla and IARI, New Delhi³⁴. Some work on the development of evaporative coolers for storing horticultural produce have also been done at several other institutions in the country. Only a few studies on this aspect have been reported from abroad, probably because this technology has not been considered very relevant in advanced countries.

Thompson and Kasmire^{49,50} developed an evaporative cooler for vegetable crops, where a wetted pad made of commercially available aspen fibre was used for cooling purpose. The total pad area was 8 sq. ft (0.74sq.m), which resulted in an average air velocity through the pad of 50-75 fpm (0.25-0.38 m/s), ensuring nearly complete saturation of air and resulting in the lowest possible air temperature and high RH. A small pump was used to recirculate water from the bottom to the top gutter with a rate of flow of 0.42 gallons (1.59l)/min. The commodities were kept in commonly used containers inside the storage chamber. It was observed that the cooling rate was dependent on rate of air flow per total weight of the produce. The air temperature produced by the unit was about 2°C higher than the wet bulb temperature. The test unit provided optimum RH and acceptable temperature conditions for cooling most types of chilling sensitive products.

Vakis⁵⁴ reported that in Kenya, a cheap cool store was made with local grass for the storage of

vegetables. The roof and walls were kept wet by dripping water from the top of the roof during the day. The relative humidity in the store was higher than outside. This simple construction was effective in maintaining a temperature at about 5 to 8°C lower than the ambient temperature.

Roy and Khurdiya³⁶ constructed 4 types of EC chambers for storage of vegetables. The first chamber was made of cheap quality porous bricks and river bed sand, which later became very popular as *Zero energy cool chamber*. The other 3 chambers were ordinary earthen pots, one placed in a tank made of bricks, second one in an ordinary wooden box and the last in an ordinary fruit basket, the gap in all the cases being filled with sand. The sand and the gunny bags covering the tops of the chambers were kept saturated with water. The cool chambers maintained a temperature between 23-26.5°C and RH between 94-97% as against the ambient temperature of 24.2-39.1°C and 9-36% RH in the month of May-June. Chamber 1, i.e. the *Zero energy cool chamber* performed best with the temperature remaining between 23-25.2°C.

A *Zero energy cool chamber* for storage of about 100 kg horticultural produce was constructed with two layers of bricks as side walls leaving approximately 7.5 cm gap in between them. This gap was filled with riverbed sand. The top of the storage space was covered with *khaskhas*/gunny cloth in a bamboo

framed structure. There was no provision for mechanical ventilation. The side walls and the top cover were kept completely wet during the period of storage. It was observed that the cool chamber had a temperature of less than 28°C during summer, when the maximum outside temperature was 44 °C. The average minimum temperature of the cool chamber was either less or near the outside average minimum temperature, excepting in winter, when it maintained a few degrees centigrade more than the outside average minimum temperature³⁷.

Roy³⁵ reported that a 6 tonne capacity cool chamber was constructed with the walls made of 2 layers of brick with a 7.5 cm sand layer between them. The floor was made of wooden planks. Below the floor a tank (33 cm deep) was constructed with 4 air ducts made of brick opening at the center and submerged with wet sand. The sand in the wall and surrounding the ducts was saturated with a drip system. The top of the chamber was insulated and incorporated with an exhaust fan. The air, while passing through saturated duct and walls, cooled sufficiently and took away the heat from the produce. Sprinkling of water twice daily was enough to maintain the desired temperature and humidity. Nimkar²⁸ used mechanical ventilation in a cool chamber and observed that the cool chamber with induced draft recorded up to 1°C more temperature drop than that obtained with natural draft, which was attributed to the increase in air flow

rate through the chamber.

The *Zero energy cool chambers* and their slight variations were found suitable for increasing the shelf life of potato¹⁵, tomato^{11,39}, mango^{30,38,41,53}, grapes^{4,40,42}, mandarins/oranges^{4,28,31,43,51,56}, banana²⁷, carrots^{29,32}, ber¹², pointed gourd⁶ and aonla fruits²⁰. Roy and Khurdiya³⁷ have compared the shelf lives of some highly perishable commodities in the *Zero energy cool chamber* and ambient conditions, which are presented in Table 3.

Maini *et al.*²⁴ equipped a room (3mX3mX4m) with a desert cooler (with an air flow rate of 3000 m³/h) to store potato and observed that evaporative cooling maintained a temperature of 24-28°C and 90% RH at an ambient temperature of 30-41°C. He observed that after storage of 5 weeks, the PLW of potato in the cooled store was 9.3% as compared to 18.6% at room temperature.

Chouksey⁷ reported the design and constructional aspects of a solar-cum-wind aspirator ventilated and evaporatively cooled structure of 20 tonnes capacity for potato and other semi perishables, which was constructed at Central Potato Research Station, Jalandhar during 1984. The walls of the structure were 32 cm thick having a cavity of 10 cm in the middle filled with rice husk. The structure was constructed against normal wind direction to get the advantage of natural wind flow and the movement of air was regulated by the solar-cum-wind aspirator and natural wind flow. Vents were provided at 50cm above

ground level on windward side and aspirators at the top of the leeward wall. The air with some static pressure entered through wood wool pads, which were kept wet by trickling water from a tank. The excess water at the bottom of pads were collected by a channel and pumped to the upper tank. A perforated platform allowed the cooled air to pass through the commodity. A flase asbestos roof at the top reduced the heat load from the roof. The structure maintained a temperature of 21-25°C with 80-90% RH and ventilation of 24m³/min when the outside temperature was at 40-42°C with 30-35% RH. The storage structure was found suitable for increasing the storage life of potato to 3-5 months and reducing PLW as compared to ambient storage^{17,19,25,26,46,55}.

Nimkar²⁸ reported the development of an evaporatively cooled structure called *Village freeze* at PKV, Akola. The size of the structure was 60cmX38cmX30cm, which was fabricated by using 18 gauge mild steel sheet and covered with soft jute burlap. The chamber was placed in a tray made of m.s sheet. The capillary movement of water kept the pad area wet up to 30 cm height. It was observed that when the ambient maximum temperature varied between 38 to 41°C during the experiments in the months of April-May, the *village freeze* maintained a maximum temperature of 24-26°C. At peak hours of the day (readings were taken at 3PM), the RH inside the chamber was 80-85% as compared to 19-29% outside. The

EC chamber proved useful in increasing the shelf life of oranges and spinach.

Habibunnisa *et al.*¹³ fabricated a metallic EC chamber measuring 45cmX45cmX45cm (0.1m³ approx.) with a 2 mm GI sheet with the top side open. A metallic tray of 46cmX46cm with 4 conduit pipes of 3,6,9, and 12" length protruding to the inside of the tray were welded on the 4 corners of the tray to serve as ventilation holes when this tray was used as lid. The four sides of the metallic chamber were covered with a cloth, the top ends of which were immersed in water placed in the top tray. The whole chamber was placed in a metallic tray of 50X75 cm size containing water (bottom reservoir for the collection of excess water flowing down). The cloth surrounding the metallic chamber was made to remain wet to allow evaporation continuously by the downward gravitational flow of water. A wire mesh basket of size 30cmX30cmX30cm filled with fruits was kept inside the chamber, leaving adequate space all around the basket for the circulation of air. The EC storage increased the shelf life of apples by 6 times and Coorg mandarins by 4 times. Thiagu *et al.*⁴⁸ also used this structure and observed increased shelf life and better retention of quality for tomato.

Sharma and Kachru⁴¹ used evaporatively cooled sand stores, where a 5 cm thick potato layer was placed in between two sand layers each of 20 cm thickness on floor. In order to allow evaporative cooling, 2

l/m³ of water was sprinkled daily to wet the sand. It was observed that under low atmospheric relative humidity conditions, wet sand was suitable for storing potato for up to 90 days as compared to 60 days in jute bags and still less in other storage methods like bamboo baskets and heaps.

Rama *et al.*³³ designed two model evaporatively cooled storage structures and studied their relative performance with regard to their efficacy in maintaining the temperature close to ambient wet bulb temperature and high relative humidity. The first structure was the same as that used by Habibunnisa *et al.*¹³. The second one resembled the first one in all aspects except that the outer metallic wall was replaced by a weld wire mesh (2.5 cm² mesh) with evaporative sides covered with wet gunny cloth to provide free movement of evaporatively cooled air. The top tray used in this system (to serve as a reservoir of water to keep the gunny cloth wet) was devoid of vents. The inside temperature and relative humidity was 90±5% and 85±5% respectively. The system-2 with perforations on the evaporative surfaces not only maintained temperatures similar to system-1, but also maintained lower RH, probably because of free air circulation. The PLW of potatoes during a storage period of 1 month was 1% and 1.5% in the perforated and non-perforated chambers respectively, as compared to 2.5% under ambient conditions (20-30°C and 40-80% RH).

Umbarkar *et al.*⁵¹ studied the

effects of 3 cooling pad materials viz. fine sand, brick batt and coarse sand and 3 cooling pad thicknesses; 10, 15 and 20 cm in zero energy cool chamber of inner size 75X75X75 cm and observed that 10 cm thick brick batt provided the most favourable micro-climate required for storage of orange. Maximum temperature drop to 14°C to 18.5°C and maximum RH of 93.4-94.8% were observed in brick batt treatment, which was attributed to increase in porosity and higher water holding capacity of the pad material. However, at this stage it is felt that the additional infiltration of saturated air through brick batt into the structure would have given this effect. The width of cooling pad did not have much influence on the quality of oranges stored. The structures effectively increased the storability of oranges up to 3 weeks.

On the basis of above study, Umbarkar *et al.*⁵² designed and constructed an EC structure of 2 tonnes capacity. The walls of the structure were constructed with 10 cm thick brick batt pad sandwiched between two 10 cm thick brick perforated walls. The latter was anchored with each other by 8mm dia m.s.bars to add to the structural strength. Holes of 50X40 mm were provided between two successive brick layers for air circulation throughout the height of the structure. A thatched roof with bamboo mat and dry grass was provided for coverage at the top. At the bottom of storage stacks a free board of 10cm was left for bleed off

water from walls. The temperature inside the chamber was recorded to vary between 23-26.5°C as against ambient temperature variation between 24.85-44°C during a particular day. The RH in the structure was 85-97%. The water requirement was 325 lpd.

Acedo¹ constructed an evaporative cooler with wood, GI sheet, mesh wire and saw dust, charcoal or rice hull- wall insulation and observed that it maintained more than 90% RH and 3-6°C lower than room temperature. He observed that evaporative cooling conditions effectively inhibited fruit shrivelling and leaf wilting, reduced weight loss, prolonged the firm ripe life of tomatoes and retarded the normal ripening changes of sweet pepper. Decay, over-ripening in tomatoes, and yellowing in peach mainly caused the deterioration in EC stored product. The post harvest life was increased by almost double in all the commodities.

SCOPE FOR FUTURE WORK

There is a need to study the shelf life, biochemical and physiological parameters of many commodities under evaporative cooling conditions for making the EC structure more general and suitable for a wide range products. As the EC structures maintain a very high RH inside the chamber, these conditions would help prevent shrinkage and dehydration of the produce and reduce the rate of respiration for better shelf life. But in addition, the growth of micro-organisms would

also be accelerated, which if not controlled, would spoil the produce by rotting and discolouration. The zero energy cool chambers based on brick work and sand without mechanical air circulation deteriorate in efficiency with use and accumulate infections and diseases. Hence application of suitable antifungal chemicals were recommended for storage of different commodities in the EC chambers^{13,30,31,38,40,47}. Besides, sprouting is a major problem associated with high humidity storage of potato. Therefore, sprout suppressants were used to enhance the shelf life of potato in EC structures^{15,24,26,33}. However, the studies did not indicate whether the rate of application of these chemicals were optimum or still there was a need to examine the effect of different rates of application of the fungicides or sprout suppressants on shelf life and other quality parameters in EC chambers.

Evaporative cooling has the potentiality to reduce the temperature of a confined space and this principle was used by many researchers for developing EC structures for storage of fresh fruits and vegetables. It is evident from the review of the past work that a number of arrangements with respect to materials, geometry and operational parameters have been studied over the period of time. Most of the work on development of these structures was based on previous experience. No effort seemed to have been made to study the thermal behaviour of such a proposition, which alone would

CONCLUSION

permit an in-depth understanding of the working of an evaporative cooling system. For example, in most of the cases, only daily average temperature and RH values or the maximum and minimum values during a day for the EC chambers were reported for local climatic conditions. The behaviour of the cool chamber as a function of the ambient climatic parameters could not be quantified with the help of the reported results. It is also not clear whether the particular construction of the cool chambers as outlined by different researchers was optimum or just one of the multitude of options. The EC system could further be exploited in movement of perishables through trucks by cooled draft of air from the front with a water trickling system on pads.

It is already established that lower the temperature at which the commodity is stored, the less likely it is to develop abnormalities with resultant loss of quality and nutritive value. Hence if there is a possibility to reduce the gap between the potential evaporative cooling and actually observed effects, more particularly in comparatively bigger structures, then it would be very much beneficial to the common growers. Therefore, studies on quantifying the different parameters affecting the thermal environment of EC structures need to be carried out, which would help in efficient designs of evaporatively cooled structures. The clubbing of evaporative cooling with refrigerated cooling could also be investigated to get the maximum return on investment.

The EC structures have widely been tested for their adaptability for storage of fruits and vegetables with or without application of chemicals. It has been well established that the shelf life of fresh horticultural produce can be increased by 2-6 times in EC chambers. The small investment needed to set up an EC system and its low energy requirements make it especially suitable for adoption by farmers and road side merchants who do not have the financial resources to invest in a mechanically cooled storage room or cooling facility. However, further research needs to be carried out for comparative evaluation of these coolers for maximum thermal effect. Further, as the evaporatively cooled structures maintain very high humidity, the produce should be properly pretreated to safeguard against spoilage, and hence the code of practices to be followed for storing commodities in EC storages needs to be standardised for its popularisation.

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Table 1. Recommended storage temperatures and humidities for selected vegetable crops

| Commodity | Temperature, °C | Relative humidity % |
|-------------------------|-----------------|---------------------|
| Cucumbers | 7-10 | 90-95 |
| Eggplant | 7-10 | 90 |
| Musk melons | 7-10 | 85-95 |
| Okra | 7-10 | 90-95 |
| Sweet peppers | 7-10 | 90-95 |
| Firm ripe tomatoes | 7-10 | 85-90 |
| Pumpkins, winter squash | 10-13 | 70-75 |
| Sweet potatoes | 13-16 | 85-90 |
| Mature green tomatoes | 12-31 | 85-90 |

Table 2. Air temperature obtainable by single stage evaporative cooling (at atmospheric pressure-30 inch and altitude 0-1000ft)

| Dry bulb, °F | Relative humidity, % | Wet bulb, °F | Temperature of air cooler (80% saturation) |
|--------------|----------------------|--------------|--|
| 100 | 11 | 64.0 | 71.5 |
| | 15 | 66.0 | 73.0 |
| | 17 | 68.0 | 74.5 |
| | 21 | 70.0 | 76.0 |
| | 25 | 71.5 | 77.5 |
| 90 | 15 | 60.0 | 66.0 |
| | 19 | 62.5 | 68.0 |
| | 24 | 64.5 | 69.5 |
| | 29 | 66.8 | 71.8 |
| | 34 | 68.5 | 73.0 |
| 80 | 20 | 56.5 | 61.0 |
| | 26 | 59.0 | 63.0 |
| | 33 | 61.0 | 65.0 |
| | 40 | 63.5 | 67.0 |
| | 46 | 65.5 | 68.5 |

Table 3. Shelf life of some selected fruits and vegetables in evaporatively cooled *Zero energy cool chamber*.

| Item | Outside | | Cool chamber | |
|---------------|---------|------------------|--------------|------------------|
| | PLW, % | Shelf life, days | PLW, % | Shelf life, days |
| <i>Dhania</i> | 30.0 | 1 | 13.0 | 3 |
| Chilli | 23.3 | 3 | 8.8 | 6 |
| <i>Karela</i> | 18.2 | 2 | 5.6 | 6 |
| <i>Bhindi</i> | 14.0 | 1 | 5.0 | 6 |
| Carrot | 29.0 | 5 | 9.0 | 12 |
| Radish | 24.7 | 5 | 4.1 | 10 |
| Beet | 14.5 | 5 | 2.3 | 12 |
| Peas | 29.8 | 5 | 9.2 | 10 |
| Cauliflower | 16.9 | 7 | 3.4 | 12 |

GENERAL ARTICLES

FOOD PROCESSING INDUSTRY- CURRENT SCENE AND PROSPECTS*

by Omesh Saigal

Secretary

Dept. of Food Processing Industries, Govt. of India

The food processing industry in India is on an assured track of growth and profitability over the coming decades. It is estimated that it will attract phenomenal investment-capital, human, technological and financial-of over Rs. 1.4 lakh crore in the next decade.

With a total crop output of 600 million tonnes (MT) in 1995, only marginally less than the 608 million MT of the United States in the same year, India is the world's second largest food producer, after China's 856 MT in 1995. In the production of sugar, tea, milk, fruits and vegetables and rice, India ranks either first or second with a share of world production ranging from 10 percent to 30 percent. The total value of our processed food sector today is estimated to be around Rs.70,000 crore, while this output has been assessed to be capable of being raised to Rs. 250,000 crore by year 2008.

Horticultural crops in India are currently grown in 12 million hectares which represent 7 per cent of India's total cropped area. Annual horticultural production is estimated at 131 million metric tonnes, which is over 18 per cent

of India's gross agricultural output. India is one of the largest producers of fruits and vegetable with 44 million MT tonnes of fruit production in 1999-00 and vegetable production of 87.5 million MT tonnes in the same period. India has the world's largest number of livestock and ranks first in the cattle population and is the second largest milk producer in the world.

This is the flip side. The flop side is that the enormous production and its potential is marred by colossal wastage, very low level of processing and non-availability of post-harvest infrastructure. As per the report prepared in 1981 by Shri M.S Swaminathan, former Member of the Planning Commission, upto 40 percent of certain fruits and vegetables go waste due to their perishable nature and non-availability of appropriate post-harvest infrastructure. As per

another study viz., Technology Information for Costing and Assessment Council (TIFAC) of the Department of Science & Technology published in 1996, wastages in certain fruits is as high as over 30 percent and in case of vegetables the losses are upto 20-30 percent at the post harvest stages due to poor storage, transportation/lack of infrastructure and the inadequacy of the marketing set up. India wastes more fruits and vegetables than are consumed in a country like U.K. The total wastage in all food sectors is as high as Rs. 50,000 crore. If even half the wastage could be prevented, we will have enough calories to bring the nutritional status of our poor to above subsistence levels.

Farmers in India only receive 20 to 30 percent of the retail price of fruits and vegetables. Those in more efficient systems with fewer intermediaries receive as much as

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40 to 50 per cent. Milk cooperatives in India have demonstrated that by reducing the number or intermediaries the farmers share of the revenue can be increased from 50 per cent to over 90 per cent of the processor price.

Food Processing Industry is of enormous significance for India's development because of the vital linkages and synergies that it promotes between the two pillars of the economy, namely industry and agriculture. It will give India the potential to become number one in food production with sustained efforts. The growth potential of this sector is enormous and it is expected that the food production will double in the next 10 years, marking improvement in consumption of value added foods.

Growth of the Food Processing Industry will also bring immense benefits to the economy, raising agricultural yields, meeting productivity, creating employment and raising the standard of very large number of people throughout the country, specially, in the rural areas. Economic liberalization and rising consumer prosperity is opening up new opportunities for diversification in Food Processing Sector. Liberalization of world trade will further open up new vistas for growth.

The Food Processing Industry has been identified as a thrust area for development. This industry is included in the priority lending sector. Most units of the Food

Processing Industry have been exempted from the provisions of industrial licensing under Industries (Development and Regulation) Act, 1951 with the exception of beer and alcoholic drinks and items reserved for Small Scale Sector, like vinegar, bread, bakery. As far as foreign investment is concerned automatic approval for even 100 per cent equity is available for majority of the processed food items.

Some startling statistics regarding prospects for the processed food sector in India have been revealed by a study done by Mckinsey & Company recently. Food in our country, it indicates, is already a Rs. 2.5 lakh crore industry. The study visualizes the year 2000 and beyond as a period of immense growth and development in this sector. Not only is the food processing industry estimated to reach a gross value of Rs. 5 lakh crore but value added foods are expected to grow at a much faster rate, i.e. to expand from Rs. 80,000 crore to Rs.2.25 lakh crore by 2005 AD. By 2005, the study says, some 20 crore people will move from subsistence foods, like cereals and pulses, to basic products demanding more processing. The study points out that inefficiencies in food sector is due to 6-7 intermediaries as compared to 2-3 in other countries. Though the study specifically forecasts major opportunities in processed milk, poultry, packaged atta and bakery products, processing

of fruits and vegetables will not lag behind.

These estimates of growth of the food processing industry are being aided by our fast changing social structures. The joint family is disintegrating, the number of working women is rising, the per capita income is increasing leading to diversification of food consumption patterns and the upper middle and middle classes are fast increasing. All these will provide a major market for processed foods. Thus whichever way we look at it, the food processing industry in India is on an assured track of growth and profitability over the coming decades. It is estimated that the transition will attract phenomenal investment-capital, human, technological and financial- of over Rs.1.4 lakh crore in the next decade.

Although we are one of the largest producers of raw materials for the food processing industry in the world, the industry itself is extremely underdeveloped in India. Less than 2 percent of fruit and vegetable production is processed compared with 30 percent in Thailand, 70 percent in Brazil, 78 percent in Philippines and 80 percent in Malaysia. The value addition in the food sector is still very low at 7 percent.

In the last decade, India moved from an era of scarcity to one of plenty. In the production of fruits and vegetables, which was just 50 percent of the total quantity of

food grains production, it has now become 66 percent of the total quantity of production of food grains. By the year 2010 it is estimated that the production of fruits and vegetables would be 80 percent of the quantity of food grains produced in India. Coupled with the fact that the yield of these crops in India is just about one-third compared to other countries, we can imagine the sort of spurt that is possible in the sector.

In the situation that prevails in India, 90 percent of the fruits and vegetables are marketed by the farmers as compared to less than 20 percent of cereals. This shows that the main challenge the food sector is going to face in the coming decades will be one of marketing, which hitherto has been a major constraint in its growth and it is here that the thrust of our policy will have to be.

In this scenario, food processing becomes critical. This would mop up surpluses at farm level and ensure fair price for the producer. It would also ensure availability of the produce at reasonable price for the consumer. In addition, the employment generation potential of this sector is much higher than other sectors, i.e., 54,000 persons get direct employment per Rs. 1000 crore of investment in the food sector in comparison to 48000 in textiles and 25000 in paper industry. There is also a four-fold generation of indirect employment in the ancillary and other downstream activities on

account of the investment in the food sector. Further more 60 percent of the employment generation is in small towns and rural areas.

The primary reason why this sector has not developed is that agriculture has largely been for subsistence and not market driven. This has not yielded adequate surpluses for processing and, coupled with the low yield of crops, has choked it. The lack of awareness about the processable variety of raw material and the non-availability of suitable raw material in terms of size, colour, texture etc., has contributed to the absence of volumes of processable varieties and, therefore, economies of scale. The present tax structure also drives a wedge between branded products manufactured in the organised sector and products from the unorganised sector and products from the unorganised sector. In fact, the tax in India on processed food is amongst the highest in the world and this has been a major single impediment in attracting investments, both locally and from abroad. This is coupled with the fact that investments in the processing sector are in any case high risk and yield low returns. Investments are further depressed because despite the apparent advantage of hygiene and quality, the price sensitive Indian consumer has stayed away from the high priced packaged foodstuff.

Another reason for poor processing is the high risk and low

margins of this sector on account of seasonality, nonavailability of raw material, high inventory carrying cost due to purchases at the time of abundance and the very high cost of packaging, i.e., around 40 percent, of the estimates of product price. Lastly the issue of poor infrastructure, such as lack of integrated cold chain, roads, power etc., has also hampered processing.

There is need to aim at increasing food processing from a low of 2 percent as at present to 10 percent by 2010. This would entail an investment of Rs. 1,40,000 crore in the Food Processing Sector. The investment would generate direct employment for about 77 lakh persons and indirect employment for about 3 crore. This would also reduce wastages by about Rs. 8000 crore. Apart from these advantages the value addition of food products will go up from 7 percent to 35 percent which will be reflected in corresponding increase in GNP. The thrust will, therefore, have to be to attract foreign and domestic investment and generate internal accruals of above said magnitude. It is relevant to note that in the first few years after 1991-92 when the industry was de-licensed and major impediments of FDI were removed, a total investment of Rs. 7200 crore was committed. This trend was reversed only when excise duty was first introduced in 1997-98.

The existence of multifarious laws and multiple authorities is a

major hurdle. Many of these laws were framed some 50 years ago like Prevention of Food Adulteration Act and were meant to serve the purpose of food safety and to prevent adulteration. Similarly, many of the statutory orders like Fruit Products Order, Meat and Meat Products Order were brought into being under the Essential Commodities Act when there was acute scarcity of food items. In the context of liberalisation these laws throttle development and invariably work as dampeners for the growth of the industry. There is, therefore, an acute need for harmonising the existing food laws and to bring about a development orientation to facilitate faster growth of the industry.

This approach would bring about corporate entities operating large integrated food procurement cum distribution companies, which operate from the farm to the department store. In this changed scenario the small scale industries which constitute the majority of the food processing industries need to be adequately protected. In order to provide adequate protection and help them, the industrial corporates as delineated above will have to become anchors to assist and nurture them. Besides these anchor industrial corporates, a number of food parks could be established so as to provide adequate help in adhering to international standards by means of establishment of common facilities. The chosen/anchor industries will help them to

market the primary and secondary level of processed items and to convert them into value added products for sale through their different network of distribution channels including export.

In the short term, by means of bringing about a tax holiday for the food processing sector for a period of 10 years a proper enabling environment can be created for bringing in adequate investments both from within the country and through foreign direct investment. Such a tax holiday need not cover tobacco, aerated drinks, Indian made foreign liquor and plantation items. The enactment of Processed Food Development Act and measures for generic promotion can also be done by means of market intelligence. The attempt during the short term period of say the next 3 years should be to develop a strong data base and a market intelligence network. Besides, certain special provisions will also have to be made for development of North-Eastern region, hilly areas, islands, ITDP, desert areas and other difficult areas.

In the medium term of 5 to 10 years the policy framework should attempt to establish a network of R & D institutions. Identification of anchor industrial corporates and development of food parks in all the states with reference to their regional strengths could be achieved during this period. Appropriate policies and schemes could be envisaged for establishment of cold chain and developmental

related infrastructure, development and transfer of new technologies and product specific packaging, development of appropriate processable varieties of raw material, bringing about futures trading and equalisation funds as well as establishment of network of institutions and testing laboratories to achieve international standards so as to make Indian products export-worthy. There is need to propagate non-polluting, cheap technologies e.g. irradiation and biotechnology for preservation of food.

One of the key resultants of the policy is the Food Processing Development Act. The proposed Act envisages a single authority for harmonising and clarifying the function of each player. The Department of FPI will have the role of development while food safety, distribution and other regulatory functions will continue to be administered under existing legislations. The Act would have a developmental focus rather than regulatory nature of the present enactments. The emphasis will be on development of the FP sector as a whole, the concept of merit goods and encouragement to industries producing merit goods, equalization fund and futures trading for price stability and the need to take cognisance of genetically modified goods, and government response to them. The policies and guidelines in FP sector be they relate to HRD, R&D, taxation or regulations also need to be addressed holistically.

In conclusion, it can be said that while the current level of food processing may reflect the primitive rural marketing structure, improvements in this sector can bring out vast improvements in value addition in agricultural products, creation of new employment, especially in the small towns and rural areas, improvement in the nutritional status of the rural women and the poor and

availability of cheaper and better products for the consumers. World wide, the food processing industries are considered sun-rise industries and have the potential of attracting huge local and foreign investments. These investments will not only accelerate the pace of industrialization, but will also lead to improvements in both rural and urban infrastructure. A well run food processing industry ensures

that the producer gets remunerative prices for his product, the consumer pays less for higher and assured quality. The price to be paid in the shape of tax holiday, may no doubt, mean a few crores of loss to the exchequer but that will be more than amply compensated by the additional investment inflows as also by long term gains to the government's fiscal resources.

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FOOD MACHINERY

Hraninvest-Hranmashcomplect AD is a leading Bulgarian company in the manufacture of food processing equipment.

Hraninvest-Hranmashcomplect AD was established in 1968 by unifying machine plants specialized in the food industry and as from 1991 it became a public limited company.

The company can provide the complete range of engineering services such as research, design, manufacture, delivery, erection, commissioning and after-sales service of process lines in the following branches:

- Production and bottling of soft drinks, juices, nectars, vegetable oil, wine, beer, strong drinks and similar products.
- canning
- dairy
- bakery
- tobacco preliminary processing
- refining of raw sunflower oil

MANAGEMENT OF FOOD PROCESSING INDUSTRY*

R. Krishnan

*CFTRI Alumnus and Food Consultant.**D 5/1, Government Polytechnic Quarters, Atinho, Panaji 403 001, Goa, India.*

Management of Food Industry involves expertise and application in all quarters of the industry like planning, procurement, processing, quality control and assurance, selling and distribution and accounting the entire process.

Planning is essential to line up the priorities. In the days to come, development of technology to produce our traditional foods in a cost-effective manner would go a long way in our favour. Further

Management of Food Industry involves expertise and application in all quarters of the industry like planning, procurement, processing, quality control and assurance, selling and distribution and accounting the entire process.

planning of funding structure etc., can easily be done once the priorities are done correct. It is necessary to decide the method of processing as to be indigenous or imported. In both the cases, the technical support availability, in any form - transfer of technology, technical manpower availability, equipment availability and their quality, need to be evaluated. It is to be emphasized that a good quality product whether it is based on indigenous technology or imported one, has always a good market and by itself adds value to its sale. Of course, it has to match with the society

norms - like breakfast cereals taking more time to find their hold in our society than quick fermenting *idlis* or *dosa* !

Material cost invariably forms about 70% of the manufacturing cost in most of the food processing industries and it is needless to stress its importance. But it must be understood that a good quality material input gives a good quality product and of course, it is also true that a good quality material need not be expensive if sourced properly. As most of the raw materials are agricultural and seasonal, a careful procurement strategy is essential. A long term perspective in procurement is favourable-like encouraging good extension services. Purchase price of materials need to be flexible-only 10% of the produce in our country is processed and 30-40% is wasted-so pricing needs to be flexible sometime to the farmer's favour. Good extension service would not only provide constant supply of good quality material but also a reasonable bargaining power for the manufacturer in the long run. Modified atmosphere storage conditions or cold stores would be a good investment in the long run, reducing the material wastage. This useful practice is followed by most of the food

processing industries abroad but alas! very few food processors in our country have these facilities in-built. It has to be remembered that material is also money, so wastage of material must be avoided to reduce the manufacturing cost. Computers can play an important role in managing the best inventory for the working.

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In processing, management of various spheres comes into picture-viz. man, machine and material. Manpower management is essential but to be looked as forming a workforce to give a good quality product. The actual direct labour costs in most of the processes work out to around 5% -certainly much less than the material cost and hence needs that much less attention! Trained workforce is an asset for a manufacturer and it gives flexibility in quantity, quality, variety and general aesthetics of the unit. Selection of a good machine, based on sound background datum with actual involvement would give a trouble-free working. Investment

* Reprinted from *Indian Food Industry*, September - October 2000.

in machinery needs to be viewed in a long-term perspective-one cannot expect to use a cycle throughout one's career-change from cycle to a better mode of transport is essential! Careful analysis of unit operations of the processing line would give the ideal capacity requirement at each stage. In-house seminars, discussions, with an atmosphere of a class room both at managerial and nonmanagerial levels on the processing steps bring out suggestions improving the quality, quantity and reducing the cost. Watertight compartment operations do not work to the benefits of the industry!

Trained workforce is an asset for a manufacturer and it gives flexibility in quantity, quality, variety and general aesthetics of the unit.

Both control and assurance of quality are essential and the main lifelines of the product and the savers of the investment made into

Good Food Manufacturing Practice shall percolate to every individual of the unit irrespective of the department. Proper recording of data at the processing line will help in keeping up the quality.

the project. Here again, action needs to be taken with a long term perspective-flexibility to conform to bigger standards of quality. Like charity begins at home, quality of the product begins at the floor level. It is a MUST to involve every

individual of the project to be quality conscious-both direct and indirect labour. Many a quality problems have been solved by suggestions given by supposed - to be insignificant people of the unit! *Never ever compromise on quality standards.* Despite outside standards, other standards must be set after close study of the contemporaries, the processing methods and the consumers circle. Once this is achieved, it is easy to bend the methodology to stick to much stricter requirements. Good food manufacturing practice shall percolate to every individual of the unit irrespective of the department. Proper recording of data at the processing line will help in keeping up the quality.

Accounting is necessary to employ computer networking at all strategic points of the unit to collect periodic data and to process them into the costing of the product. It is possible to monitor the cost of manufacturing on a day-to day basis, if not shiftwise. The computers do not think on their own! It is essential to first feed in relevant validated data for future processing. A more or less accurate costing is possible even before commissioning the plant, if the fed-in data are based on sound assumptions. A proper costing leads to efficient functioning of the unit and thus the further management of funds! Because rightly costed product brings in funds more than the outflow and makes the manufacturer happier.

Accounting is necessary to employ computer networking at all strategic points of the unit to collect periodic data and to process them into the costing of the product. It is possible to monitor the cost of manufacturing on a day-to-day basis, if not shiftwise.

A scientific approach to selling and distribution is essential. A good study of the competitors products- if available or otherwise in case of new venture products, a good survey of the prospective consumers is necessary. A good quality product adds more value to it by itself and hence need not be underpriced. A good quality product has no boundaries-it can easily go global. Global market is the order of the near future for better realization. A product should never be underestimated, otherwise the entire project study from the

A good quality products has no boundaries - it can easily go global. Global market is the order of the near future for better realization.

beginning should be restarted. The product should be sold on its merit to earn the deserved profit, as the profit, at least a good part of it, needs to be ploughed into generate better product to earn more and more.

In conclusion, the minor details of each of the steps have not been gone in-depth, but it is certain that any food processor taking adequate care in macro-style would benefit himself and thus the country.

LAW HITTING FOOD PROCESSING UNITS

T. S. Nagarajan

Former Marketing Director, Brooke Bond

AS PART of its reforms process, the Government of India has been initiating moves to streamline procedures and create a more favourable climate for industrial growth. The processed foods industry has been identified as a thrust area and the government is keen to push it on to the fast track of growth. Earlier identified as a sunrise industry, the processed foods sector has been languishing.

But it is heartening to see the government recognising the intrinsic value and potential of processed foods as an engine of growth of late. I will deal with only two of the critical areas: taxation and archaic food laws. The Indian consumer, especially at the lower economic scale, is a very discriminating buyer when it comes to price. This is because of his small income and limited purchasing power. His rupee has to go a long way to make both ends meet.

He, therefore, looks at the value of the commodity inside the package. High levels of duties dilute value to such an extent as to price the product out of the market. Let

me give an example. Wheat as a food grain bears no excise duty because it is an essential commodity. The same wheat when processed into a hygienic and appetising product like pasta attracts heavy excise duty. This anomaly must be removed in the processed foods area if it has to stimulate volume growth.

The food laws in India are mainly intended to protect the citizen from wilful adulteration and malpractice. It is called the Prevention of Food Adulteration Act (PFA). This is, of course, very necessary and every civilised country legislates to provide its citizens complete safety and protection from malpractice. However, the Indian Act—through numerous amendments and administrative notifications—takes upon itself the role of a Quality Assurance Body. This assumes a serious dimension when we realise that offences under the PFA Act, if convicted, involve compulsory imprisonment.

To illustrate by example, one of the serious cases of adulteration is in the adding of argemone seeds to mustard seeds to cheapen the

commodity. Argemone seeds contain an alkaloid which causes blindness. The punishment for this under the PFA Act is the same as in the case of a product which has only marginal variation in specification, such as four parts per million (PPM) of rare metal in tea! The government cannot, of course, make any compromise where the safety and health of its citizens are concerned, but there must be a sense of proportion which distinguishes wilful adulteration from deviation from quality standards.

In other words, the punishment must fit the crime. There is, therefore, a genuine case for a relook at the PFA Act and for constituting a separate food safety administration authority charged with implementing the rules. At present, under its archaic rules, the implementation is left with local bodies who have no facility or training to implement the Act. We have been promised that, very soon, a comprehensive draft Bill will be introduced to spell out a new national policy for processed foods which will promote the growth of this segment of the economy.

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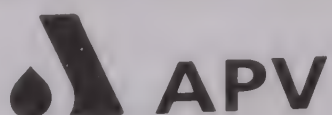


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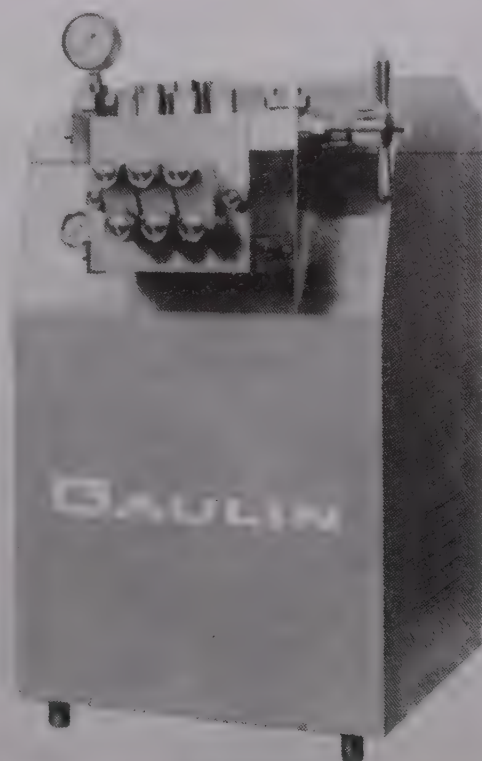


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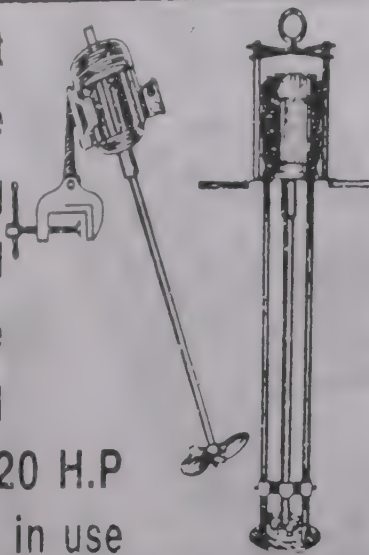


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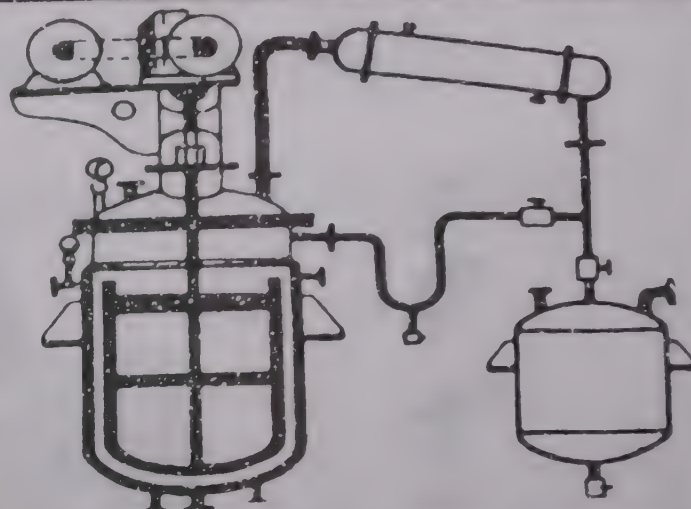
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